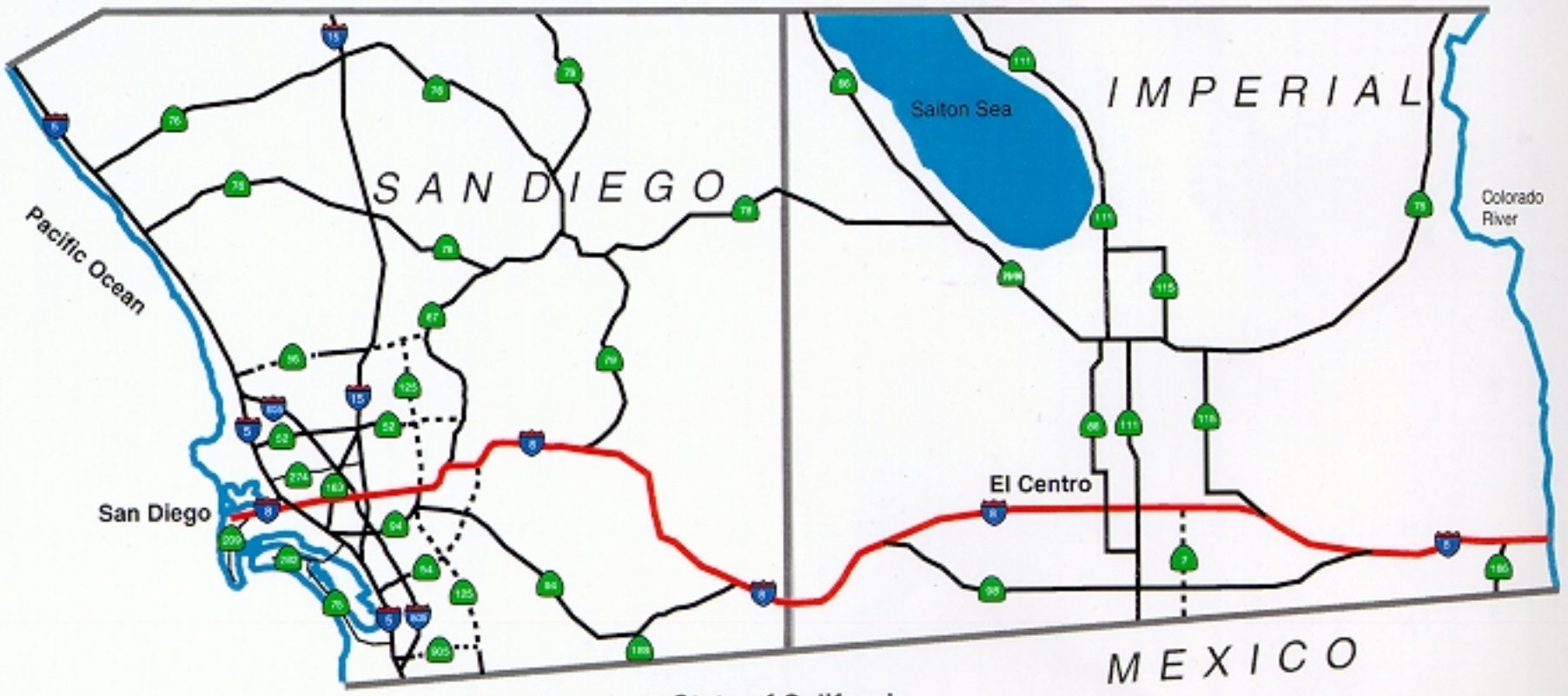
TRANSPORTATION CONCEPT REPORT
INTERSTATE 8
11-SD-8 P.M. L0.0 - R77.8
11-IMP-8 P.M. 0.0 - R97.0
November 1996



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TRANSPORTATION CONCEPT SUMMARY
INTERSTATE 8 (I-8)
11-SD-8 P.M. L0.0 - R77.8
11-IMP-8 P.M. 0.0 - R97.0

EXECUTIVE SUMMARY

Interstate 8 (I-8) is an east-west interstate highway facility serving San Diego and Imperial Counties. I-8 begins in San Diego at its junction with Sunset Cliffs Boulevard, Post Mile (P.M.) SD L0.0. The portion of this route that is within District 11 extends 276.8 kilometers (km) (172.0 miles) to its eastern terminus at the California-Arizona State Line (P.M. IMP R97.0) near Yuma, Arizona. I-8 continues into Arizona until it intersects with I-10 near Casa Grande.

In the San Diego area, I-8 interconnects all the major north-south metropolitan freeways including I-5, State Route (SR) 163, I-805, I-15, SR-125, SR-67 and SR-54. As it continues east, it accesses the southern terminus of SR-79 (P.M. SD R37.8) and the eastern terminus of SR-94 (P.M. SD R65.9). I-8 crosses into Imperial County, connecting with the western terminus of SR-98 (P.M. IMP 10.1), a parallel facility. Within Imperial County, I-8 intersects with SR-86, SR-111 [access to the international Port of Entry (POE) at Calexico] and SR-115. I-8 then reconnects with SR-98 at its eastern terminus. Finally, it accesses the SR-186 connection to the international border station of Andrade, and terminates at the Arizona state border.

The primary purpose of I-8 in the San Diego area is to provide for east-west movement of commuter and interregional traffic. The eastern portion of I-8 beyond the urban area is primarily an interregional route used for goods movement, and for access to mountain and desert recreational areas. I-8 provides access between San Diego and El Centro, Calexico, Yuma and other desert communities. Rather than travel on the parallel facility in Mexico, many residents of Mexico enter the U.S. at Calexico and utilize I-8 to shop, recreate and work in the San Diego region.

I-8 is the primary route used by Imperial County agricultural producers to ship products into the San Diego area. This has been particularly true since the parallel railway was disrupted in 1976 and again in 1983. In turn, I-8 provides access to suppliers of the agricultural support industries. I-8 also connects distribution centers and consumers between the San Diego region and the Calexico/Mexicali region and beyond.

Table S-1 shows the existing operating conditions for I-8. The route is segmented for traffic analysis and other purposes.[1] Table S-1 reflects 1995 data.

[1] The segmentation shown is for planning purposes only and is subject to change pending further studies or project related activities.

TABLE S-1
EXISTING OPERATING CONDITIONS

	Segment/ County Post-Mile	Location	No. Lanes/ Facility Type	ADT	Peak Hour D/C Ratio	Peak Hour Operating LOS[1]
1	SD L0.0 - L1.2	Sunset Cliffs Blvd. to Midway Drive	4F	51 100	0.55	C
2	SD L1.2 - R0.0	Midway Drive to I-5	4F	95 000	0.76	D
3	SD R0.0 - 2.4	I-5 to SR-163	8F	188 100	0.95	E
4	SD 2.4 - 4.4	SR-163 to I-805	8F	205 400	1.05	F_0
5	SD 4.4 - 5.6	I-805 to I-15	8F[2]	260 100	1.18	F_0
6	SD 5.6 - 9.6	I-15 to Lake Murray Blvd.	10F	234 700	1.12	F_0
7	SD 9.6 - 12.4	Lake Murray Blvd. to SR-125	8F	166 700	0.99	E
8	SD 12.4 - 15.8	SR-125 to SR-67	8F	175 300	0.98	E
9	SD 15.8 - R18.7	SR-67 to Greenfield Drive	6F[3]	86 500	0.91	D
10	SD R18.7 - R25.7	Greenfield Drive to Dunbar/Harbison Canyon	4F	47 700	0.72	D
11	SD R25.7 - R28.5	Dunbar/Harbison Canyon to Tavern	4F	34 200	0.44	B
12	SD R28.5 - R31.3	Tavern to W. Willows (Urban/Rural limit)	4F	23 400	0.24	A
13	SD R31.3 - R34.3	W. Willows (Urban/Rural limit) to E. Willows	4F	20 100	0.22	A
14	SD R34.3 - R37.8	E. Willows to Japatul (SR-79)	4F	20 600	0.22	A
15	SD R37.8 - R65.9	Japatul (SR-79) to Ribbonwood (SR-94)	4F	11 100	0.14	A
16	SD R65.9 - R77.8	Ribbonwood (SR-94) to Imperial County Line	4F	9 400	0.12	A
17	IMP R0.0 - R37.0	San Diego County Line to Imperial Avenue	4F	10 200	0.12	A
18	IMP R37.0 - R40.9	Imperial Avenue to SR-111	4F	22 700	0.26	A
19	IMP R40.9 - R65.8	SR-111 to SR-98	4F	8 100	0.09	A
20	IMP R65.8 - R97.0	SR-98 to Arizona State Line	4F	10 900	0.12	A

4F = Four lane freeway
ADT = Average Daily Traffic
LOS = Level of Service
R = Rural
U = Urban
V/C = Volume to Capacity

[1] Analysis includes auxiliary lanes where appropriate.
[2] This segment includes two westbound and two eastbound auxiliary lanes (connectors). Including these additional lanes would increase the ADT to over 300 000.
[3] This segment is 4F from P.M. SD R17.7 - R18.7

TRANSPORTATION CONCEPT (2015)

The components of the 2015 Transportation Concept include State highway, transit service and arterial street improvements, as well as system management, travel reduction, goods movement, international border, aviation and nonmotorized components. The major State highway improvements are described in Table S-3, while the others are discussed in the Concept Rationale section.

The Transportation Concept for I-8 is shown in Table S-2. This table examines the route in segments based on future route development and traffic analysis, and lists the facility type and the number of lanes for the year 2015, the Average Daily Traffic (ADT) for 2015, the Peak Hour Demand to Capacity Ratio (D/C) for 2015, the 2015 Peak Hour Operating Level of Service (LOS), and the 2015 Transportation Concept LOS.

The 2015 traffic projections for I-8 are based on California Department of Transportation (Caltrans) traffic forecasts and the San Diego Association of Governments' (SANDAG) Series 8 regional population and employment forecasts and assume completion of the future regional transportation system. The 2015 traffic projections are subject to change based on periodic traffic forecasting model adjustments and ongoing supplemental transportation studies.

The 2015 Peak Hour Operating LOS includes all proposed transit, regional arterial and State highway improvements, including High Occupancy Vehicle (HOV) facilities. It also includes expansion and greater utilization of the existing arterial street network. Even with these improvements, the 2015 peak hour Operating LOS for Segments 2 through 8 (Midway Drive to SR-67) will be deficient (LOS 'E' or worse). Additional improvements such as the implementation of Transportation Control Measures (TCM), Transportation System Management (TSM) and Transportation Demand Management (TDM) strategies will be needed.

The 2015 Transportation Concept LOS for urbanized facilities within San Diego County is based on the SANDAG Congestion Management Program (CMP). The CMP standard of LOS 'E' is the 2015 Transportation Concept for Segments 1 and 2 and Segments 7 through 12. The CMP standard of LOS 'F_0' is the 2015 Transportation Concept for Segments 3 through 6. For Segments 13 through 16 and 18 through 20, the 2015 Transportation Concept is based on District System Planning LOS guidelines for rural highways. The Transportation Concept for these segments is LOS 'B'. For Segment 17, the Concept LOS is 'D' and is also based on District System Planning LOS guidelines.

The 2015 peak hour Operating LOS is equal to or better than the minimum CMP standard in Segments 1 and 3 and in Segments 9 through 20.

POST-2015 ULTIMATE TRANSPORTATION CORRIDOR

The post-2015 Ultimate Transportation Corridor (UTC) describes the long term (beyond the 20 year planning period) right of way requirements for a particular segment. The long term needs are determined by Advanced Transportation System Plans, General Plans, Transportation Plans, Land Use Plans, Environmental Documents, and other planning documents. The intent is to take advantage of or develop opportunities for long term right of way acquisition and to work with local and regional agencies to implement corridor preservation measures. The number of lanes and facility type for the UTC shown in Table S-2 are based on Caltrans planning studies. The UTC is the same as the 2015 Transportation Concept facility, with the exception of Segment 10, where the UTC includes the addition of two main lanes.

TABLE S-2
2015 TRANSPORTATION CONCEPT AND POST-2015 ULTIMATE TRANSPORTATION CORRIDOR

	Segment/ County Post-Mile	Location	No. Lanes/ Facility Type	ADT[1]	Peak Hour D/C	Peak Hour Operating LOS[2]	Concept LOS[3]	U/R	UTC/ Width
1	SD L0.0 - L1.2	Sunset Cliffs Blvd. to Midway Drive	4F	71 000	0.84	D	E	U	4F
2	SD L1.2 - R0.0	Midway Drive to I-5	4F	120 000	1.16	F_0	E	U	4F
3	SD R0.0 - 2.4	I-5 to SR-163	10F	195 000	0.97	E	F_0	U	10F
4	SD 2.4 - 4.4	SR-163 to I-805	8F	241 300	1.34	F_1	F_0	U	8F
5	SD 4.4 - 5.6	I-805 to I-15	8F[4]	252 000	1.38	F_2	F_0	U	8F
6	SD 5.6 - 9.6	I-15 to Lake Murray Blvd.	10F	235 300	1.27	F_1	F_0	U	10F
7	SD 9.6 - 12.4	Lake Murray Blvd. to SR-125	8F	174 900	1.21	F_0	E	U	8F
8	SD 12.4 - 15.8	SR-125 to SR-67	8F	186 300	1.13	F_0	E	U	8F
9	SD 15.8 - R18.7	SR-67 to Greenfield Drive	8F	111 300	0.90	D	E	U	8F
10	SD R18.7 - R25.7	Greenfield Drive to Dunbar/Harbison Cyn.	6F	55 700	0.67	C	E	U	8F
11	SD R25.7 - R28.5	Dunbar/Harbison Cyn. to Tavern	6F	44 000	0.53	B	E	U	6F
12	SD R28.5 - R31.3	Tavern to W. Willows (Urban/Rural limit)	6F	35 000	0.33	A	E	U	6F
13	SD R31.3 - R34.3	W. Willows (U/R limit) to E. Willows	4F	42 000	0.31	A	B	R	4F
14	SD R34.3 - R37.8	E. Willows to Japatul (SR-79)	4F	42 000	0.31	A	B	R	4F
15	SD R37.8 - R65.9	Japatul (SR-79) to Ribbonwood (SR-94)	4F	28 000	0.34	A	B	R	4F
16	SD R65.9 - R77.8	Ribbonwood (SR-94) to Imperial Co. Line	4F	22 500	0.24	A	B	R	4F
17	IMP R0.0 - R37.0	San Diego County Line to Imperial Ave.	4F	18 200	0.20	A	B	R	4F
18	IMP R37.0 - R40.9	-Imperial Ave. to SR-111	4F	34 200	0.33	A	D	U	4F
19	IMP R40.9 - R65.8	-SR-111 to SR-98	4F	10 700	0.11	A	B	R	4F
20	IMP R65.8 - R97.0	-SR-98 to Arizona State Line	4F	22 100	0.22	A	B	R	4F

2C = Two lane conventional highway
4C = Four lane conventional highway
4E = Four lane expressway
4F = Four lane freeway
ADT = Average Daily Traffic
LOS = Level of Service
R = Rural
R/W = Right of Way
U = Urban
UTC = Ultimate Transportation Corridor
V/C = Volume to Capacity

[1] ADT's within San Diego County based on SANDAG Series 8 2015 Build traffic forecasting model, May 1995. ADT's within Imperial County are based on Caltrans traffic projections.

[2] 2015 Peak Hour Operating LOS includes provision of State highway and arterial improvements.

[3] Concept LOS is based on SANDAG CMP standards and District 11 System Planning LOS guidelines.

[4] This segment includes two westbound and two eastbound auxiliary lanes (connectors), whose capacity is not included in the ADT.

CONCEPT RATIONALE

An intermodal analysis is used to evaluate how to accommodate the projected increase of person-trips in the I-8 corridor and achieve the 2015 Transportation Concept LOS. This approach includes consideration of highway, transit, aviation and non-motorized modes, goods movement and international border issues, and system management and travel reduction, including analysis of air quality issues.

Highway Component

The State highway component of the Concept includes upgrading Segment 3 (I-5 to SR-163) from an eight lane freeway to a ten lane freeway. Upgrading from a six lane freeway to an eight lane freeway is recommended for Segment 9 (SR-67 to Greenfield Drive). Upgrading from a four lane freeway to a six lane freeway is recommended for Segments 10, 11 and 12 (Greenfield Drive to the Urban/Rural Limit at West Willows).

Operational and safety improvements, auxiliary lanes and ramp metering with HOV lane bypass should also be provided where necessary.

Transit Component

The San Diego region has five transit center[1] locations dispersed along the I-8 corridor between Old Town in San Diego and El Cajon. Light rail transit (LRT) lines currently parallel the I-8 corridor from downtown San Diego through Lemon Grove, La Mesa and El Cajon. Extension of the line from downtown into Old Town was completed in June 1996. Further extension of this line into Mission Valley and on to Rancho Mission Road is expected in FY 1998. Additional extension of the line through Mission Valley from Rancho Mission Road to the East Line trolley station at Grossmont Center is proposed.

At the present time in San Diego, there are two express bus service routes providing peak period service to commuters in the I-8 corridor. San Diego Transit Route 270 provides one inbound morning peak period trip from Kearny Mesa/Tierrasanta to downtown San Diego, and one homebound afternoon peak period trip. It utilizes the portion of I-8 from SR-163 to I-15 on its westbound morning trip. An increase to 15 minute peak period service is planned for this route. San Diego Transit Route 40 operates Monday through Friday between downtown San Diego and San Carlos/Fletcher Hills, and utilizes the portion of I-8 from I-805 to Waring Road. It provides five inbound trips from approximately 6:00 A.M. to 8:00 A.M. into downtown San Diego, and six homebound trips on 30 minute headways from approximately 3:00 P.M. to 5:30 P.M. An increase to 15 minute peak period service for Route 40 is planned.

In the event the light rail transit system is not extended east of Rancho Mission Road, an express bus alternative may be implemented. The express bus (Route 980/980X) would operate on I-8 and arterial streets between the Grossmont and Rancho Mission LRT stations, serving bus stations at 70th Street, San Diego State University, and Grantville.

There are three San Diego County Transit Routes operating in the I-8 corridor. One provides hourly service daily from the El Cajon Transit Center to the Viejas Reservation. Improvement to 30 minute peak service is planned for FY 1998. Two routes operate one round trip each per day between Grossmont Center and Morena Village/Jacumba. All routes provide access to the San Diego Trolley. Bus service changes will be made to

[1] Transit centers are major off-street passenger stations that are situated at high volume boarding and transfer locations.

coordinate with the Mission Valley West Trolley extension in FY 1998. A new route from Pine Valley to Alpine is scheduled to open in FY 2000.

Imperial County Transit runs one bus per week between El Centro and Winterhaven.

Within Imperial County, no significant transit system expansion in the I-8 corridor is planned through 2015.

Greyhound Bus Lines provides intercity bus service in the I-8 corridor. There are bus stations in downtown San Diego, El Cajon and El Centro. Greyhound runs four buses daily each way between San Diego and Yuma, Arizona. There is one additional bus daily from San Diego to El Cajon, and one additional bus each way between El Centro and Yuma, Arizona.

In a March 1995 study, District 11 explored some of the issues involved in providing new passenger rail service and improved rail cargo shipping between Los Angeles and Mexico via Calexico and the Coachella Valley in Riverside County. There was insufficient information to assess capacity of the Union Pacific/Southern Pacific main line between Colton and Niland, and the impact of additional passenger trains on freight service was not determined. Both bus and air services between Mexico City and Los Angeles are competitive with rail service in terms of frequency, time and cost.

System Management and Travel Reduction Component

Major strategies to increase the operational efficiency of the I-8 facility include increased ramp metering, greater utilization of the existing and proposed arterial street network in the corridor, implementation of TCM and the provision of Park and Ride facilities. Use of HOV lanes was considered, but there is insufficient width in the median of I-8 in the urban area (typically 6.7 meters or 22 feet) to construct such a facility. The current policy is not to convert mixed flow lanes to HOV lanes. In addition, I-8 is most congested where other freeways intersect, and continuity of HOV lanes through freeway interchanges is associated with high costs.

Thirty-two of the on-ramps on I-8 in the urban area are currently metered, and ten of these have a preferential carpool lane. Four additional ramp meters are programmed or under construction. It is expected that by the year 2000, all eastbound ramps from Nimitz to El Cajon/Spring Street, and all westbound ramps from Lake Jennings to Taylor Street, will be metered. Freeways and freeway connectors will not be metered.

There are several arterial streets that parallel or intersect I-8 that provide alternative routes for travel. Some of these streets may fail to provide an efficient alternative to I-8. In such instances, improvements may be required of local jurisdictions. Increased capacity can typically be enhanced by realignment and/or widening, correcting physical inadequacies and access conflicts, minimizing side friction, and improving the signalization.

SANDAG coordinated the development of the *1995 Regional Arterial System (RAS) Project Priority List* which includes unfunded/underfunded candidate projects that could

compete for future discretionary transportation funding allocations. SANDAG has also developed the *Traffic Signal Optimization Program* (April, 1994). This program was developed to enhance inter-jurisdictional coordination, to provide detailed guidelines for the implementation of a county-wide traffic management system, and to identify a conceptual plan for future implementation of an Advanced Traffic Management System (ATMS), one of several Intelligent Transportation System (ITS) technologies. The proposed signal system improvements are expected to significantly reduce vehicle emissions and traffic congestion. Discussion of the ITS is expanded in a separate section below.

In April 1991, SANDAG adopted the Regional Transportation Control Measure Plan for Air Quality to reduce traffic congestion and motor vehicle emissions in the San Diego air basin, consistent with State and federal regulations. Tactics include a commute travel reduction program, a college travel reduction program, a goods movement/truck operation control program; a transportation capacity expansion program, a traffic systems management program; and an indirect source control program. Measures also include staggered work hours, parking management, developer and employer incentives and implementation of local ordinances.

Park and Ride facilities encourage and support the use of commuter or express transit and car/vanpooling for a portion of longer vehicle trips and consequently reduce Vehicle Miles of Travel (VMT) within the San Diego region. There are 11 Park and Ride lots near or adjacent to I-8. The lot at Camino Canada in San Diego County will be expanded per a developer agreement. Both the light rail and express bus alternatives under consideration between Rancho Mission and Grossmont Center include new or expanded Park and Ride facilities in the I-8 corridor.

Goods Movement Component

Goods movement is an essential component of the integrated transportation system. The health, welfare and prosperity of the region's population depends upon the reliable, safe and efficient transport of goods and services. However, the impacts of noise, air quality, land use, congestion and safety must be addressed. In addition, the transportation system must be managed, operated, maintained and improved by considering and balancing the needs of all users. I-8 is considered to be a major goods movement corridor. Although most goods are transported by truck within the I-8 corridor, other modes include rail, ports and shipping, air cargo and pipelines.

East-west rail service from the San Diego area currently bypasses the I-8 transportation corridor. Eastbound rail freight must first travel north into Orange County and San Bernardino County. From there it can continue eastward through Barstow or transfer to Union Pacific/Southern Pacific Rail to Calexico or Yuma.

The San Diego and Arizona Eastern (SD&AE) railway once provided an east/west rail connection between San Diego and Imperial County. However, the SD&AE rail line has been closed east of Carrizo Gorge since 1983 due to the condition of several tunnels and trestles damaged by fire, flooding and cave-ins. Therefore, freight rail activity within the SD&AE rail corridor is currently limited to the San Diego/Tijuana/Tecate area.

SANDAG recently completed an economic feasibility study of the repair and rehabilitation of the SD&AE line from Carrizo Gorge east to Plaster City. Restoration of the line would expand market opportunities and accommodate the additional transportation demand. Because of the cost-effectiveness of trucking over rail for trips of less than about 500 miles, restoration of the line would potentially displace only the long-haul truck trips that are currently being made on I-8. Funding to restore the rail line is now being sought.

San Diego International Airport at Lindbergh Field is a major freight intermodal facility which accesses the I-8 corridor. Trucks haul the air cargo to and from the facility; there is no rail access. Most of the domestic air freight market today is mail or small/lightweight packages with local origins and destinations. San Diego's ability to compete for heavyweight air cargo is limited because it has virtually no wide body service (28 weekly), and because it provides no direct international air cargo service without going through Los Angeles or other major airport.

Caltrans District 11 conducted an origin/destination truck survey at the Port of San Diego in November 1992. It was determined that the air cargo facility generated 412 truck trips per day[1]. Because of its low proportion of air cargo to population and passenger traffic, it is estimated that at least 80 percent of San Diego's domestic air freight is actually accommodated by other southern California airports -- primarily Los Angeles and Ontario.

The Tenth Avenue Marine Terminal within the Port of San Diego accommodates ship, rail and truck intermodal activity. Approximately 800 000 tons of cargo were shipped through this terminal in 1994. The mode split in 1993 was approximately 90 percent truck and 10 percent rail. The share of rail freight has increased since then with the addition of the port's contract to haul mineral products from the Mojave Desert. The primary products trucked consist of newsprint, fertilizer, canned tuna, cement, grain and breakbulk goods.

Generally fewer than five percent of the trucks from the National City Marine Terminal drove on the I-8 facility, demonstrating very little impact. This terminal was found to generate 785 trucks per day. The primary products shipped through this facility are automobiles and lumber.

Imperial County is one of the nation's most productive agricultural areas, with gross revenues for agricultural commodities of over one billion dollars. While Imperial County's mild growing climate permits year-round growing, crops are harvested and shipped during seasonal peak periods.

The vast bulk of Imperial County agricultural products are shipped to Los Angeles for processing and distribution throughout the country. However, I-8 remains an important

[1] The air cargo figures do not include the air mail facility, which generates 172 trucks a day. Approximately half of these trucks carry mail to the main post office using only City of San Diego streets. In addition to transporting air cargo, trucks are also needed to service the airport facility itself, particularly for the air catering business and airport concessions.

goods movement corridor because the San Diego region is itself a strong market for Imperial County agricultural products, and in turn provides needed agricultural supplies.

A truck scale facility is located on I-8 near Winterhaven. A new Weigh-In-Motion bypass system is planned for this site. This will enable certain transducer-equipped trucks to avoid stopping at the scale, and quite possibly obtain clearance from the nearby Agricultural Inspection Station at the same time.

Liquid Petroleum (LP) products are carried through Imperial County via the 50.8 cm (20 inch) Santa Fe Pacific Pipe Line. It is generally located within the Union Pacific/Southern Pacific right of way. Southeast of Ogilby, the line turns east and travels to Yuma. Parallel to I-8, a 15.2 cm (six-inch) branch line distributes gas to the storage facility south of Imperial, and a 10.2 cm (four-inch) line serves the Naval Air Facility near Seeley.

Natural gas is delivered by the Southern California Gas Company via twin 25.4 cm (ten-inch) lines. Like the LP line, the main line runs north-south serving communities from Niland to Calexico; but east-west branch lines within the I-8 corridor serve Holtville, Seeley, the Naval Air Facility and Plaster City.

International Border Component

In southern California, primary goods movement routes for U.S./Mexico trade are located between Tijuana and Los Angeles through San Diego, and between Calexico/Mexicali and Los Angeles. In Imperial County, the trucks generally head north-south on SR-86. The rail freight is also oriented north-south through Imperial County on the Union Pacific/Southern Pacific rail line as previously discussed. The restoration of the SD&AE line to connect with the Union Pacific/Southern Pacific line would give the San Diego region good rail access to Mexico's interior. The Union Pacific/Southern Pacific line runs along the entire 3200 km (2,000 mile) border and connects to the Mexican railroad at five locations.

The U.S./Mexican Border contributes a modest volume of trucks to the I-8 corridor. In 1993, Caltrans District 11 conducted a truck origin/destination survey at four POEs: San Ysidro, Otay Mesa, Tecate and Calexico. The Calexico POE processed approximately 1100 trucks per day. About eight percent (90) of these trucks had origins or destinations in Imperial County; eight and one-half percent (100) had origins or destinations in San Diego County; and three and three-tenths percent (40) had origins or destinations in Arizona. Of the approximately 2300 trucks per day at the San Diego County POEs, 15.4 percent (350) had origins or destinations in San Diego; fewer than one percent had origins or destinations in Imperial County.[1]

[1] Figures are approximate based on a five-day week.

In future plans, the major north-south transportation corridor in Imperial County will utilize only a small segment of I-8. The corridor is to extend from the new Calexico POE six miles east of Calexico, and utilize future SR-7, SR-111 and SR-86 to access I-10 in Riverside County.

A new and technically sophisticated Commercial Vehicle Enforcement Facility (CVEF) has been constructed and will begin operations along with the new POE at Calexico. It will facilitate the inspection of trucks entering California for compliance with various laws and regulations including weight, vehicle maintenance, licensure and air quality.

Because of the passage of the North American Free Trade Agreement (NAFTA), numerous planning studies are underway related to transborder transportation and goods movement activities. The current rate of travel and trade growth is expected to substantially increase under NAFTA, but at this time it is difficult to estimate the impact. There are a number of policy and implementation issues that have yet to be determined. Any increase in border trade could result in a higher truck volume on I-8, depending on commodity type and market availability.

Aviation Component

Although the Aviation Component is not as critical to the 2015 Transportation Concept as the other modal options, ground access issues to and from airport facilities could have an impact on the State highway system. I-8 provides access to the Jacumba Airstrip in San Diego County, a publicly-owned general aviation facility with approximately 3000 annual operations. I-8 also provides access to the Naval Air Facility in El Centro, which supports military operations. There is a small private airport in the I-8/SR-94 vicinity.

Nonmotorized Component

Bicycle travel is an integral part of the regional transportation plans. While bicycle travel on the freeways is generally prohibited, it is allowed on the shoulders when alternative bike routes are not available. Bicycles are permitted on the following segments of I-8:

14 East Willows Road to Japatul Road (SR-79)
17 In- Ko- Pah Road to Imperial Highway
20 Gordon Wells Road to SR-186

In San Diego, regional corridor bikeways exist within the I-8 corridor along major arterials, and expansion of this network is planned. Bikeways continue eastward from Greenfield Drive on Olde Highway 80. San Diego Transit operates bicycle rack-equipped buses within the I-8 corridor. The San Diego Trolley runs a similar program between downtown San Diego and El Cajon. Caltrans has installed bike lockers at Park and Ride lots and trolley stations adjacent to the I-8 corridor.

Outside of San Diego County, the Regional Mobility Element of the Southern California Association of Governments (SCAG) 1994 Regional Transportation Plan contains a Non-Motorized Action Program for the sub-regions, aimed toward establishing a non-

motorized network providing safe and convenient access to activity centers and transit centers. To this end, the Imperial Valley Association of Governments (IVAG) is coordinating with SCAG to develop non-motorized maps and plans. The program is to contain bicycle parking, bicycle- and pedestrian-friendly roadway features such as lighting, bicycle sensitive loop detectors and audible crosswalk signals, amenities such as shower and locker facilities, safety programs, promotional programs and enforcement programs.

The Circulation Element of the Imperial County General Plan includes a bicycle facilities program meant to provide an integrated bicycle circulation system. On-street bicycle lanes are to be planned into appropriate prime, major and secondary arterials. The General Plan Circulation Element for the City of El Centro also includes a system of bicycle lanes and routes to accommodate bicycle commuters and students.

It should be noted that usage of bicycle facilities within the I-8 corridor in Imperial County in most cases is limited to three seasons due to the temperature extremes prevalent in the region in the summertime.

INTELLIGENT TRANSPORTATION SYSTEM (ITS)

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) calls for the creation of an economically efficient and environmentally sound transportation system that will move people and goods in an energy efficient manner. This can no longer be done by simply adding to the existing highway system. The Intelligent Transportation System (ITS) offers the potential to improve safety and efficiency in nearly every function of our complex multi-modal transportation system by applying a broad range of diverse technologies. The U.S. Department of Transportation has defined an Intelligent Transportation Infrastructure (ITI) Program consisting of traffic detection and monitoring, communications and control systems required to support a variety of ITS products and services.

New Technology

ITI/ITS Programs offer the potential to deploy and operate traffic signal control systems, freeway management systems, transit management systems, incident management systems, electronic fare payment systems, electronic collection systems and multi-modal traveler information systems.

Under the ISTEA ITS Program, four transportation corridors in the nation have been selected in order to showcase coordinated intelligent transportation system elements. One of the priority corridors selected is the Southern California Intelligent Transportation Systems Priority Corridor. This corridor lies within the major urbanized and adjacent non-urbanized areas of Ventura, Los Angeles, San Bernardino, Riverside and San Diego Counties and all of Orange County. In San Diego, I-15 is included as part of the corridor.

ITS activities in the San Diego region include the innovative use of the existing solar powered freeway call box infrastructure, the development of a

multifunctional/multimodal Transportation Management Center (TMC), the provision of automated traffic operation information to fleet operators in the goods movement, transit and hazardous material industries, and the development of an ITS International Border Crossing Operations Strategic Plan. Additional ITS technologies that could be utilized in the San Diego region are changeable message signs and television roadway monitoring devices.

Another related new technology is the future provision of an Automated Highway System (AHS). ISTEA mandated development of an automated highway and a vehicle prototype from which future fully automated intelligent vehicle highway systems can be developed. Caltrans is a core member of The National Automated Highway System Consortium (NAHSC), which was formed to specify, develop and demonstrate a prototype of a working AHS in the United States by 2001. AHS technology will consist of at least two major subsystems, including vehicles and infrastructure. AHS will showcase features such as adaptive cruise control, object detection, collision warning and avoidance systems, longitudinal and lateral vehicle control, maneuver coordination and navigation systems. The specifications will provide for evolutionary deployment that can be tailored to meet regional and local transportation needs. The consortium will seek opportunities for early introduction of vehicle and highway automation technologies to achieve timely benefits for all surface transportation users.

Congestion Pricing Studies

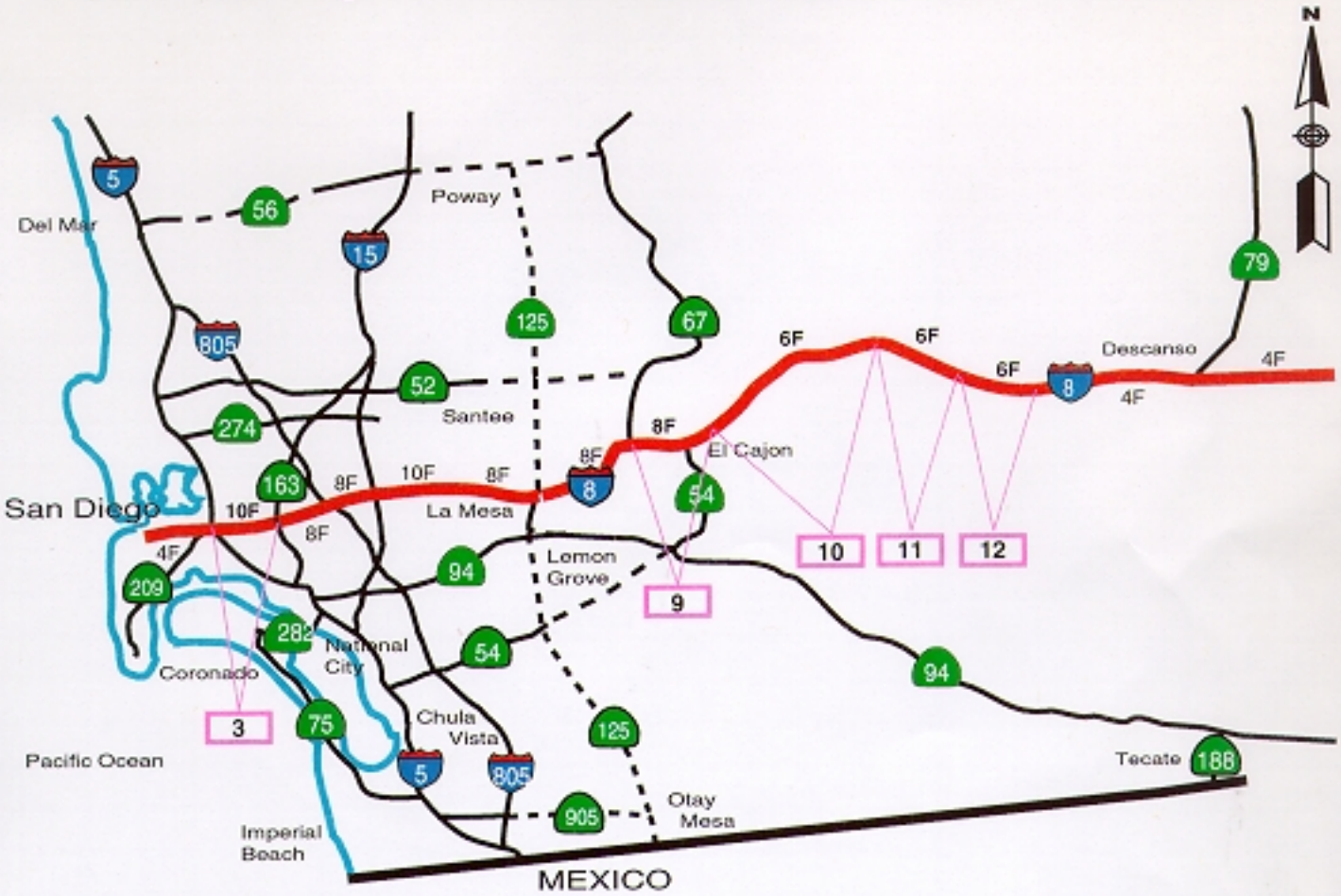
An additional strategy that should be studied in the future is congestion pricing, which is a direct market incentive to ensure that transportation system users pay the "real" costs of the transportation benefits they receive. One purpose of congestion pricing is to reduce travel demand. With the advent of technological advances such as Electronic Toll Collection and Traffic Management (ETTM) and Automatic Vehicle Identification (AVI) systems, congestion pricing could be developed for a wide variety of transportation facilities.

ISTEA provides funding of up to $25 million annually over the 1992-97 period to support federal participation in congestion pricing pilot programs. SANDAG was awarded a federal technical assistance grant from the Federal Highway Administration (FHWA) for a two-phased pilot program which will allow single occupant vehicle drivers to “buy-in” to the existing I-15 reversible HOV lanes. The intent of this pilot program is to test market-based roadway pricing concepts to better manage traffic congestion and air quality in the region, while raising revenues for the expansion of transit services and HOV facility improvements.

2015 TRANSPORTATION CONCEPT FACILITY IMPROVEMENTS

Figure 1 on Page xiv displays the main lane facility improvements that are part of the 2015 Transportation Concept. The Peak Hour D/C and Peak Hour Operating LOS listed assume completion of the proposed improvements. The 2015 Transportation Concept map on the following page graphically depicts the location of facility improvements included in the 2015 Transportation Concept for I-8. The 2015 Transportation Concept for Segments 1, 2, 4-8 and 13-20 reflect no changes to the

Figure 1
2015 Transportation Concept Improvements



LEGEND

——— Freeways

- - - - - - Future Freeways

CALIFORNIA DEPARTMENT OF TRANSPORTATION
DISTRICT 11
SYSTEM PLANNING BRANCH
NOVEMBER 1996
NOT TO SCALE

2015 TRANSPORTATION CONCEPT FACILITY IMPROVEMENTS

	Segment/ County Post Mile	Location	Improvement Description	Peak Hour V/C Ratio	Peak Hour Operating LOS	Concept LOS
3	SD R0.0 - 2.4	I-5 to SR-163	Upgrade from 8F to 10F	0.97	E	E
9	SD 15.8 - R18.7	SR-67 to Greenfield Drive	Upgrade from 6F to 8F	0.90	D	D
10	SD R18.7 - R25.7	Greenfield Drive to Dunbar/ Harbison Canyon	Upgrade from 4F to 6F	0.69	C	D
11	SD R25.7 - R28.5	Dunbar/Harbison Canyon to Tavern	Upgrade from 4F to 6F	0.66	C	D
12	SD R28.5 - R31.3	Tavern to W. Willows (U/R Limit)	Upgrade from 4F to 6F	0.33	A	B

No improvements are proposed for segments in Imperial County.

Segment 6 has non-standard width of the traveled way. Improvement to meet federal interstate standards would not result in added lanes or increased capacity.

6F = Six lane freeway
8F = Eight lane freeway
10F = Ten lane freeway
LOS = Level of Service (For Concept Facility)
V/C = Volume to Capacity (For Concept Facility)
Concept LOS is based on SANDAG CMP Standards and District System Planning LOS guidelines for San Diego and Imperial Counties

existing facility. However, Segments 3 and 9-12 have been identified for future highway improvements.

The main lane facility improvements to I-8, along with planned operational and safety improvements, will facilitate interregional travel throughout and between San Diego County and Imperial County, improve intercity and international travel between Mexico and San Diego, and provide an improved facility for the movement of goods throughout the region. Additional strategies, including TDM and TSM, such as Park and Ride facilities, should be implemented where appropriate.

TRANSPORTATION CONCEPT REPORT
INTERSTATE 8 (I-8)
11-SD-8 P.M. L0.0 - R77.8
11-IMP-8 P.M. 0.0 - R97.0

INTRODUCTION AND STATEMENT OF PLANNING INTENT

The system planning process consists of three products: the District System Management Plan (DSMP), the Transportation System Development Plan (TSDP), and the Transportation Concept Report (TCR).

The DSMP describes how District 11 intends to maintain, manage, and improve the District transportation system over the next 20 years. The DSMP is developed in partnership with regional and local transportation planning agencies. The DSMP summarizes 20 year planning concepts and proposed transportation improvements on a system wide level, and influences the development of future transportation concepts and development plans. It integrates land use, modal opportunities, regional arterial plans, transportation system management, transportation demand management, highway system improvements, and the District highway network into a comprehensive transportation program. The DSMP serves as the foundation for the TSDP and the TCRs.

The TSDP is an internal Department of Transportation (Caltrans) system planning document. Its purpose is to identify by district a reasonable and effective list of multimodal transportation improvements (infrastructure/capital outlay), strategies, demand, and system management options to improve Statewide, interregional and regional mobility and intermodal transfer of people and goods. It includes both “Recommended Plan” and a “Cost Constrained Plan” components, and categorizes improvements into two time frames, 2001-2015 and post-2015. It is based on analysis of current and projected future travel demand. The TSDP replaces the District 11 Route Development Plan.

The TSDP is an internal "sketch" planning document that broadens the Department's assessment of mobility options at an early preliminary planning stage. It expands system planning from a basic analysis of State highway route deficiencies to a larger integrated intermodal and multimodal analysis of travel corridors. The TSDP joins the principles, practices, and concepts of the Advanced Transportation System Development (ATSD) program to system planning.

Improvements, strategies, and system management options identified in the TSDP will be Caltrans’ "candidates" for further detailed examination in State, metropolitan, regional or local studies and processes. The TSDP is also the Department's initial identification of areas under consideration for Major Investment Studies (MIS) with metropolitan agencies and rail/transit operators.

The TCR is a planning document which describes the Department's basic approach to the development of a given corridor. Considering reasonable financial constraints and projected travel demand, the TCR establishes a 20 year

transportation planning concept and identifies modal transportation options needed to achieve the concept. The concept considers operating Levels of Service (LOS) and modal improvements. The TCR also considers potential long term needs for the corridor beyond the 20 year planning period. The long term needs focus on the Post-2015 Ultimate Transportation Corridor (UTC) and new technologies.

The TCR is a preliminary planning phase that leads to subsequent programming and the project development process. As such, the specific proposed nature of improvements (i.e., number of lanes, access control, etc.) may change in later project development stages, with final determinations made during the Project Study Report (PSR), Project Report (PR) and design phases.

Each TCR must be viewed as an integral part of a planned system. The TCR is based on the completion of the 20 year system. The system has been developed to meet anticipated travel demand generated from regional growth forecasts. Removal of any portion of a route from the system will adversely affect travel on parallel or intersecting routes.

The TCR is prepared by Caltrans District 11 staff in cooperation with local and regional agencies. TCRs will be updated as necessary as conditions change or new information is obtained.

ROUTE DESCRIPTION

Interstate 8 (I-8) is an east-west interstate highway facility serving San Diego and Imperial Counties. I-8 begins in San Diego at its junction with Sunset Cliffs Boulevard, Post Mile (P.M.) SD L0.0. The portion of this route that is within District 11 extends 276.8 kilometers (km) (172.0 miles) to its eastern terminus at the California-Arizona State Line (P.M. IMP R97.0) near Yuma, Arizona. I-8 continues into Arizona until it intersects with I-10 near Casa Grande.

In the San Diego area, I-8 interconnects all the major north-south metropolitan freeways including I-5, State Route (SR) 163, I-805, I-15, SR-125, SR-67 and SR-54. As it continues east, it accesses the southern terminus of SR-79 (P.M. SD R37.8) and the eastern terminus of SR-94 (P.M. SD R65.9). After it crosses into Imperial County it connects with the western terminus of SR-98 (P.M. IMP 10.1), a parallel facility. In Imperial County, I-8 intersects with SR-86, SR-111 (access to the international POE at Calexico) and SR-115. It then reconnects with SR-98 at its eastern terminus. Finally, it accesses the SR-186 connection to the international border station of Andrade, and terminates at the Arizona state border.

I-8 was added to the State Highway System in three sections:

1. Former Route 12 from San Diego (I-5) to El Centro in 1909.
2. Former Route 27 from El Centro to the Arizona State Line in 1915.
3. Former Route 109 from Sunset Cliffs Boulevard to I-5 in 1915.

I-8 was added to the Freeway and Expressway System in 1959.

Purpose of Route

The primary purpose of I-8 in the San Diego area is to provide for east-west movement of commuter and interregional traffic. The eastern portion of I-8 beyond the urban area is primarily an interregional route used for goods movement, and for access to mountain and desert recreational areas. I-8 provides access between San Diego and El Centro, Calexico, Yuma and other desert communities. Rather than travel on the parallel facility in Mexico, many residents of Mexico enter the U.S. at Calexico and utilize I-8 to shop, recreate and work in the San Diego region.

Imperial County is one of the most productive agricultural areas in the nation. The county's agricultural products include cotton, sugar beets, alfalfa, and table vegetables such as asparagus, broccoli and carrots. Most of these perishable products are shipped during seasonal peak periods as the crops are harvested. While most of the produce is shipped to the Los Angeles area, I-8 is the primary route used by Imperial County agricultural producers to ship products into the San Diego area. This has been particularly true since the parallel SD&AE railway which ran from San Diego to Plaster City/El Centro was disrupted in 1983. In turn, I-8 provides access to suppliers of the agricultural support industries. I-8 also connects distribution centers and consumers between the San Diego region and beyond to the Calexico/Mexicali region and beyond.

Existing Facility Classifications

The functional classification for each segment of I-8 is shown in Table 1.

The functional classification of I-8 from I-5 to the Arizona State Line is Interstate. From the Urban/Rural Limit (SD P.M. R31.3) to the Arizona State Line (IMP P.M. R97.0), I-8 is included as a part of the Interregional Road System (IRRS).

I-8 in its entirety from Sunset Cliffs Boulevard to the Arizona State Line is a National Highway System (NHS) route. I-8 has been designated by Caltrans District 11 as a State Highway Impacted by NAFTA. The portion of I-8 from I-5 to the Arizona border is a designated route in the National Network for Surface Transportation Assistance Act (STAA) for trucks; I-8 west of I-5 is a terminal access route to the national network. I-8 from Lake Jennings Park Road to the Imperial County Line is part of the San Diego Region Oversize Load Highway System.

The length of I-8 from I-15 in San Diego County to the future junction with SR-7 east of El Centro is included in the Statewide List of Lifeline Routes. A lifeline route is a route that is deemed so critical to emergency response/life saving activities of a region or the State that it must remain open immediately following a major earthquake, or for which preplanning for detour and/or expeditious repair and reopening can guarantee through movement of emergency response activities.

I-8 from Sunset Cliffs (SD P.M. L0.0) to Highway 98 (IMP P.M. R10.3) is on the Master Plan of State Highways Eligible for Official Scenic Highway Designation.

The Intermodal Corridors of Economic Significance (ICES) system was created in response to 1994 State legislation that required the Department to identify the significant transportation arteries in the State that connect or provide access to major sea or waterway ports, nationwide railway systems, airports and interstate and intrastate highway systems. I-8 from I-5 to the Arizona State Line is designated as part of the ICES system.

For maintenance programming purposes, the State Highway System has been classified as Class 1, 2, and 3 highways based on the Maintenance Service Level (MSL) descriptive definitions:

MSL 1 contains route segments in urban areas functionally classified as Interstate, Other Freeway/ Expressway, or Other Principal Arterial. In rural areas, the MSL 1 designation contains route segments functionally classified as Interstate or Other Principal Arterial.

MSL 2 contains route segments classified as an Other Freeway/Expressway or Other Principal Arterial not in MSL 1, and route segments functionally classified as minor arterials not in MSL 3.

MSL 3 indicates a route or route segment with the lowest maintenance priority. Typically, MSL 3 contains route segments functionally classified as major or minor collectors and local roads, route segments with relatively low traffic volumes, and route segments being considered for relinquishment, rescission, or where a new alignment will replace the existing facility. Route segments where the District does not anticipate spending money and route segments where route continuity is necessary are also assigned an MSL 3 designation.

I-8 is classified as MSL 2 for segments 1 and 2, and MSL 1 for segments 3 through 20.

There is rolling terrain from approximately El Cajon Boulevard in San Diego to the Imperial County Line. I-8 assumes a moderate grade for the next 9.8 miles as it winds through the Jacumba Mountains.

There is a truck escape ramp on eastbound I-8 near the Meyer Creek Bridge (P.M. IMP R3.7). There is a truck brake inspection area on eastbound I-8 in Inkopah (P.M. SD R76.8). A truck scale facility is located on I-8 near Winterhaven.

An agricultural pest inspection station is located on I-8 west of Winterhaven. An immigration checkpoint has been implemented on westbound I-8 approximately one mile east of Sunrise Highway (San Diego County S-1).

Route Segments

I-8 will be examined in 20 segments for traffic analysis purposes.[1] Table 1 lists the segments for this route and includes some of the information used as criteria for segment divisions.

TABLE 1
ROUTE SEGMENTATION

	Segment/ County Post Mile	Location	No. Lanes/ Facility Type	Rural/ Urban	Functional Classification
1	SD L0.0 - L1.2	Sunset Cliffs Blvd. to Midway Drive	4/Freeway	Urban	Other Principal Arterial - Freeway or Expressway
2	SD L1.2 - R0.0	Midway Drive to I-5	4/Freeway	Urban	Other Principal Arterial - Freeway or Expressway
3	SD R0.0 - 2.4	I-5 to SR-163	8/Freeway	Urban	Interstate
4	SD 2.4 - 4.4	SR-163 to I-805	8/Freeway	Urban	Interstate
5	SD 4.4 - 5.6	I-805 to I-15	8/Freeway	Urban	Interstate
6	SD 5.6 - 9.6	I-15 to Lake Murray Blvd.	10/Freeway	Urban	Interstate
7	SD 9.6 - 12.4	Lake Murray Blvd. to SR-125	8/Freeway	Urban	Interstate
8	SD 12.4 - 15.8	SR-125 to SR-67	8/Freeway	Urban	Interstate
9	SD 15.8 - R18.7	SR-67 to Greenfield Drive	6/Freeway	Urban	Interstate
10	SD R18.7 - R25.7	Greenfield Drive to Dunbar/Harbison Canyon	4/Freeway	Urban/ Rural*	Interstate
11	SD R25.7 - R28.5	Dunbar/Harbison Canyon to Tavern	4/Freeway	Rural[1]/ Urban	Interstate
12	SD R28.5 - R31.3	Tavern to W. Willows (Urban/Rural limit)	4/Freeway	Urban	Interstate
13	SD R31.3 - R34.3	W. Willows (Urban/Rural limit) to E. Willows	4/Freeway	Urban/ Rural[2]	Interstate
14	SD R34.3 - R37.8	E. Willows to Japatul (SR-79)	4/Freeway	Rural	Interstate
15	SD R37.8 - R65.9	Japatul (SR-79) to Ribbonwood (SR-94)	4/Freeway	Rural	Interstate
16	SD R65.9 - R77.8	Ribbonwood (SR-94) to Imperial County Line	4/Freeway	Rural	Interstate
17	IMP R0.0 - R37.0	San Diego County Line to Imperial Avenue	4/Freeway	Rural[3]/ Urban	Interstate
18	IMP R37.0 - R40.9	Imperial Avenue to SR-111	4/Freeway	Urban/ Rural[3]	Interstate
19	IMP R40.9 - R65.8	SR-111 to SR-98	4/Freeway	Rural	Interstate
20	IMP R65.8 - R97.0	SR-98 to Arizona State Line	4/Freeway	Rural[3]/ Urban	Interstate

[1] Rural from Flynn Springs (P.M. SD R23.7) to 0.34 miles West of Puetz Valley (P.M. SD 26.4).
[2] Rural from End of Viejas Creek Bridge LT (P.M. SD R31.8) to Austin Road (P.M. IMP R35.5).
[3] Rural from Urban/Rural Limit at El Centro (P.M. IMP 39.5) to Urban/Rural Limit at Yuma, Arizona (P.M. IMP 94.0)

Existing Facility

The functional classification of I-8 varies, ranging from a four lane freeway (Urban Other Principal Arterial - Freeway or Expressway) to a ten lane freeway (Urban Interstate). Segments 1, 2, 10, 11, 12 and 13 through 20 are four lane freeways; Segment 9 is a six lane freeway; Segments 3, 4, 5, 7 and 8 are eight lane freeways; and Segment 6 (I-15 to Lake Murray Blvd. in San Diego) is a ten lane freeway.

[1] The segmentation shown is for planning purposes only and is subject to change pending further studies or project related activities.

A physical description of the existing facility in a segment-specific format is shown in Table 2. Auxiliary lane locations are shown in Table 3.

TABLE 2
EXISTING FACILITY GEOMETRICS

Segment	County/ Post Mile	No. Lanes & Facility Type	Lane Width[1]	Outside Shoulder Width	Inside Shoulder Width	Max. R/W Width	Median Width	Grade Line
1	SD L0.0 - L1.2	4F	7.3 (24)	2.4-3.0 (8-10)	1.5 (5)	79.2 (260)	18.3-30.2(60-99)	Flat
2	SD L1.2 - R0.0	4F	7.3-18.3 (24-60)	2.4-3.0 (8-10)	0.6-2.4 (2-8)	79.2 (260)	16.8-18.3 (55-60)	Flat
3	SD R0.0 - 2.4	8F	7.3-21.9 (24-72)	0.6-3.0 (2-10)	0.6-3.0 (2-10)	45.7 (150)	4.3-30.2(14-99)	Flat
4	SD 2.4 - 4.4	8F	11.0-18.3 (36-60)	3.0 (10)	2.4-3.0 (8-10)	65.5 (215)	6.7 (22)	Flat
5	SD 4.4 - 5.6	8F	14.6-25.6 (48-84)	3.0 (10)	2.4 (8)	59.4 (195)	6.7 (22)	Flat
6	SD 5.6 - 9.6	10F	14.6-21.9 (48-72)	3.0 (10)	2.4 (8)	64.0-82.3 (210-270)	6.7-30.2 (22-99)	Flat
7	SD 9.6 - 12.4	8F	14.6-21.9 (48-72)	3.0 (10)	2.4-4.3 (8-14)	91.4 (300)	6.7-9.1 (22-30)	Flat
8	SD 12.4 - 15.8	8F	14.6-21.9 (48-72)	2.1-3.0 (7-10)	0.9-4.3 (3-14)	97.5 (320)	6.7-9.1 (22-30)	Flat
9	SD 15.8 - R18.7	6F	7.3-11.0 (24-36)	3.0 (10)	1.5-2.4 (5-8)	61.0-79.2 (200-260)	14.6-21.3 (48-70)	Rolling
10	SD R18.7 - R25.7	4F	7.3 (24)	3.0 (10)	1.5 (5)	67.1-106.7 (220-350)	21.3-30.2 (70-99)	Rolling
11	SD R25.7 - R28.5	4F	7.3-11.0 (24-36)	3.0 (10)	1.5-2.4 (5-8)	67.1 (220)	29.9 (98)	Rolling
12	SD R28.5 - R31.3	4F	7.3-11.0 (24-36)	3.0 (10)	2.4 (8)	67.1 (220)	29.9 (98)	Rolling
13	SD R31.3 - R34.3	4F	7.3-11.0 (24-36)	3.0 (10)	2.4 (8)	67.1-97.5 (220-320)	29.3-30.2 (96-99)	Rolling
14	SD R34.3 - R37.8	4F	7.3-11.0 (24-36)	3.0 (10)	2.4 (8)	97.5 (320)	26.8-30.2 (88-99)	Rolling
15	SD R37.8 - R65.9	4F	7.3-11.0 (24-36)	3.0 (10)	1.5-2.4 (5-8)	176.8-201.2 (580-660)	15.2-30.2 (50-99)	Rolling
16	SD R65.9 - R77.8	4F	7.3 (24)	3.0 (10)	2.4 (8)	109.7 (360)	18.3-30.2 (60-99)	Rolling
17	IMP R0.0 - R37.0	4F	7.3 (24)	3.0 (10)	1.5-2.4 (5-8)	61.0-121.9 (200-400)	6.7-30.2 (22-99)	Flat[2]
18	IMP R37.0 - R40.9	4F	7.3 (24)	3.0 (10)	1.5 (5)	61.0 (200)	18.3 (60)	Flat
19	IMP R40.9 - R65.8	4F	7.3 (24)	3.0 (10)	1.5 (5)	64.0-103.6 (210-340)	18.3-30.2 (60-99)	Flat
20	IMP R65.8 - R97.0	4F	7.3-11.0 (24-36)	2.4-4.0 (8-13)	1.5-2.4 (5-8)	61.0-121.9 (200-400)	11.0-30.2 (36-99)	Flat

C = Conventional Highway
F = Freeway
R/W - Right of Way

[1] Directional Travelway widths
[2] Moderate from P.M. IMP R0.0 to R10.1

Note: Widths are in meters
( ) Widths in feet

TABLE 3
EXISTING AUXILIARY LANES

County/P.M.	Location	Direction	Number	Comment
SD L0.0 - L1.2	Sunset Cliffs Blvd. to Midway Drive	Eastbound	1	HOV Bypass
SD L1.2 - R0.0	Midway Drive to I-5	Eastbound	2	
SD L1.2 - R0.0	Midway Drive to I-5	Westbound	2	
SD R0.0 - R0.2	I-5 to Pacific Highway	Westbound	1	
SD R0.2 -R0.4	Pacific Highway to Morena Blvd.	Eastbound	2	
SD R0.2 -R0.4	Pacific Highway to Morena Blvd.	Westbound	2	
SD R0.4 - 1.0	Morena Blvd. to Hotel Circle N./Taylor St.	Eastbound	1	
SD R0.4 - 1.0	Morena Blvd. to Hotel Circle N./Taylor St.	Westbound	1	
SD 2.2 - 2.4	Hotel Circle Dr. S to SR-163	Eastbound	2	
SD 2.2 - 2.4	Hotel Circle Dr. S to SR-163	Westbound	1	Connector
SD 2.4 - 3.0	SR-163 to Mission Center Road	Eastbound	2	Connectors
SD 2.4 - 3.0	SR-163 to Mission Center Road	Westbound	2	
SD 3.0 - 3.9	Mission Center Road to Texas Street	Westbound	1	
SD 3.9 - 4.4	Texas Street to I-805	Eastbound	1	
SD 3.9 - 4.4	Texas Street to I-805	Westbound	1	Connector
SD 4.4 - 5.6	I-805 to I-15	Eastbound	2	Connectors
SD 4.4 - 5.6	I-805 to I-15	Westbound	2	Connectors
SD 5.6 - 6.3	I-15 to Fairmount Avenue	Westbound	2	Connectors
SD 6.3 - 7.1	Fairmount Avenue to Waring Road	Eastbound	1	
SD 8.8 - 9.6	College Avenue to Lake Murray Boulevard	Eastbound	1	
SD 9.6 - 10.6	Lake Murray Boulevard to Fletcher Pkwy	Eastbound	1	
SD 10.6 - 11.0	Fletcher Parkway to Spring Street	Eastbound	1	
SD 10.6 - 11.0	Fletcher Parkway to Spring Street	Westbound	1	
SD 11.0 - 11.1	Spring Street to El Cajon Boulevard	Eastbound	1	
SD 11.1 - 11.8	El Cajon Boulevard to Jackson Drive	Eastbound	1	
SD 11.1 - 11.8	El Cajon Boulevard to Jackson Drive	Westbound	1	
SD 11.8 - 12.4	Jackson Drive to SR-125	Eastbound	1	
SD 11.8 - 12.4	Jackson Drive to SR-125	Westbound	1	
SD 12.4 - 12.7	SR-125 to Severin/Fuerte Drive	Eastbound	1	
SD 12.4 - 12.7	SR-125 to Severin/Fuerte Drive	Westbound	2	
SD 12.7 - 13.7	Severin Drive to El Cajon Boulevard	Eastbound	2	
SD 12.7 - 14.6	Severin Drive to Main Street	Westbound	2	
SD 14.6 - 15.3	Main Street to Johnson Avenue	Eastbound	1	
SD 15.3 - 15.8	Johnson Avenue to SR-67	Eastbound	1	
SD 14.6 - 15.8 -	Main Street to SR-67	Westbound	1	Connector
SD 15.8 - 16.5	SR-67 to Mollison Avenue	Eastbound	1	
SD 15.8 - 16.5	SR-67 to Mollison Avenue	Westbound	1	
SD R28.5 - R31.3	Tavern Road to West Willows (Urban/Rural Limit)	Eastbound	1	Truck Climbing Lane

There are no High Occupancy Vehicle (HOV) lanes on I-8, except for the HOV preferential bypass lane from Sunset Cliffs Blvd. to near Midway Drive and at selected metered ramps.

Accident data for the three year period from December 1, 1992 to December 1, 1995 was analyzed for I-8. Criteria used for determining an accident concern are based on whether actual total accident rates exceeded expected total accident rates by one and one half times. Average accident data for segments of concern are listed in Table 4. For segments where a concern exists, safety improvements should be considered.

TABLE 4
ACCIDENT RATES PER MILLION VEHICLE MILES

Segment	Actual Total	Expected Total
16	0.82	0.46

ROUTE ANALYSIS

This section further discusses existing conditions and introduces future Post-1996 State Transportation Improvement Program (STIP)/No Build conditions and deficiencies for I-8. This section also includes a land use/corridor growth and demographic analysis for existing and future conditions in this corridor.

Existing and Future (2015 No Build) Operating Conditions

Table 5 on Page 9 shows existing and future 2015 No Build operating conditions for I-8. Existing conditions reflect 1995 data. The future conditions are based on the San Diego Association of Governments (SANDAG) Series 8 Regional Population and Employment forecasts for the year 2015 and Caltrans' traffic forecasts and are for planning purposes only. Future No Build conditions also assume the completion of only those projects in the local transportation sales tax program (TransNet) and the 1996 STIP.

TABLE 5
EXISTING AND FUTURE (2015 NO BUILD) OPERATING CONDITIONS

County/P.M.	Location	Year	No.Lanes/ Facility Type	ADT	Peak Hour D/C	Peak Hour Operating LOS
1. SD L0.0 - L1.2	Sunset Cliffs Blvd. to Midway Drive	1995	4F	51 100	0.55	C
		2015	4F	85 000	1.17	F_0
2. SD L1.2 - R0.0	Midway Drive to I-5	1995	4F	95 000	0.76	D
		2015	4F	143 000	1.14	F_2
3. SD R0.0 - 2.4	I-5 to SR-163	1995	8F	188 100	0.95	E
		2015	8F	212 200	1.20	F_0
4. SD 2.4 - 4.4	SR-163 to I-805	1995	8F	205 400	1.05	F_0
		2015	8F	226 300	1.27	F_1
5. SD 4.4 - 5.6	I-805 to I-15	1995	8F	260 100	1.18	F_0
		2015	8F	299 000	1.56	F_3
6. SD 5.6 - 9.6	I-15 to Lake Murray Blvd.	1995	10F	234 700	1.12	F_0
		2015	10F	261 100	1.37	F_2
7. SD 9.6 - 12.4	Lake Murray Blvd. to SR-125	1995	8F	166 700	0.99	E
		2015	8F	189 700	1.29	F_1
8. SD 12.4 - 15.8	SR-125 to SR-67	1995	8F	175 300	0.98	E
		2015	8F	204 800	1.22	F_0
9. SD 15.8 - R18.7	SR-67 to Greenfield Drive	1995	6F	86 500	0.91	D
		2015	6F	187 800	2.41	F_3
10. SD R18.7 - R25.7	Greenfield Drive to Dunbar/Harbison Cyn.	1995	4F	47 700	0.72	D
		2015	4F	56 300	0.68	C
11. SD R25.7 - R28.5	Dunbar/Harbison Cyn. to Tavern	1995	4F	34 200	0.44	B
		2015	4F	49 000	0.60	B
12. SD R28.5 - R31.3	Tavern to W. Willows (Urban/Rural limit)	1995	4F	23 400	0.24	A
		2015	4F	36 000	0.44	B
13. SD R31.3 - R34.3	W. Willows (U/R limit) to E. Willows	1995	4F	20 100	0.22	A
		2015	4F	42 000	0.48	B
14. SD R34.3 - R37.8	E. Willows to Japatul (SR-79)	1995	4F	20 600	0.22	A
		2015	4F	42 000	0.48	B
15. SD R37.8 - R65.9	Japatul (SR-79) to Ribbonwood (SR-94)	1995	4F	11 100	0.14	A
		2015	4F	31 200	0.37	A
16. SD R65.9 - R77.8	Ribbonwood (SR-94) to Imperial Co. Line	1995	4F	9 400	0.12	A
		2015	4F	225 000	0.24	A
17. IMP R0.0 - R37.0	San Diego County Line to Imperial Ave.	1995	4F	10 200	0.12	A
		2015	4F	18 200	0.20	A
18. IMP R37.0 - R40.9	Imperial Ave. to SR-111	1995	4F	22 700	0.26	A
		2015	4F	34 200	0.33	A
19. IMP R40.9 - R65.8	SR-111 to SR-98	1995	4F	8 100	0.09	A
		2015	4F	10 700	0.11	A
20. IMP R65.8 - R97.0	SR-98 to Arizona State Line	1995	4F	10 900	0.12	A
		2015	4F	22 100	0.22	A

2C = Two lane conventional highway
4C = Four lane conventional highway
ADT = Average Daily Traffic
LOS = Level of Service
PHV = Peak Hour Volume (One Way)
STIP = State Transportation Improvement Program
V/C = Volume to Capacity

Corridor Growth and Demographics

San Diego County

The SANDAG Series 8 Regional Population and Employment Forecast anticipates a population growth change in the San Diego region from 2 500 000 people in 1990 to 3 600 000 people in 2015. This represents a 45 percent increase in population. Series 8 also projects a 47 percent increase in housing stock and 27 percent growth of the total labor force. This growth will require complementary land use and transportation improvements.

Table 6 shows current and projected population, housing and employment growth for selected jurisdictions within San Diego County. Table 7 depicts population, housing and employment growth for a roughly four mile corridor the length of I-8 in San Diego County.

TABLE 6
POPULATION, HOUSING AND EMPLOYMENT GROWTH
SELECTED SAN DIEGO COUNTY JURISDICTIONS

Location	Year	Total Population	% Change from Base Year	Total Housing Units	% Change from Base Year	Total Employment	% Change from Base Year
San Diego	1990	1 110 549	NA	431 722	NA	668 512	NA
	2000	1 314 248	18.3	473 187	9.6	687 978	2.9
	2010	1 409 990	27.0	513 371	18.9	742 947	11.1
	2015	1 573 656	41.7	591 437	37.0	822 468	23.0
La Mesa	1990	52 931	NA	24 154	NA	26 142	NA
	2000	58 438	10.4	24 877	3.0	27 216	4.1
	2010	59 141	11.7	25 067	3.8	29 141	11.5
	2015	59 870	13.1	25 219	4.4	31 489	20.5
El Cajon	1990	88 693	NA	34 453	NA	41 931	NA
	2000	97 580	10.0	35 071	1.8	42 729	1.9
	2010	97 034	9.4	35 160	2.1	44 499	6.1
	2015	95 757	8.0	35 470	3.0	47 287	12.8
Unincorporated Areas	1990	398 764	NA	137 589	NA	117 003	NA
	2000	498 064	24.9	160 787	16.9	124 645	6.5
	2010	593 864	48.9	194 788	41.6	142 518	21.8
	2015	794 223	99.2	269 332	95.8	168 547	44.1
San Diego Region	1990	2 498 016	NA	946 240	NA	1 198 265	NA
	2000	3 004 434	20.3	1 054 734	11.5	1 251 962	4.5
	2010	3 267 254	30.8	1 158 559	22.4	1 380 067	15.2
	2015	3 763 253	50.6	1 371 971	45.0	1 561 394	30.3

Source: SANDAG Series 8 Regional Growth Forecast, May 1995.

TABLE 7
POPULATION, HOUSING AND EMPLOYMENT GROWTH
I-8 CORRIDOR SEGMENTS - SAN DIEGO COUNTY

Location	Year	Total Population	% Change from Base Year	Total Households	% Change from Base Year	Total Employment	% Change from Base Year
Sunset Cliffs Blvd. to I-5	1990	20 695	NA	9 100	NA	26 728	NA
	2000	22 111	6.8	9 159	0.6	25 817	-3.4
	2010	22 356	8.0	9 562	5.1	26 903	0.7
	2015	22 810	10.2	9 831	8.0	27 480	2.8
I-5 to SR-163	1990	30 003	NA	14 076	NA	42 020	NA
	2000	33 151	10.5	14 605	3.8	41 328	-1.6
	2010	41 111	37.0	19 509	38.6	46 896	11.6
	2015	42 649	42.1	20 228	43.7	48 582	15.6
SR-163 to I-15	1990	55 081	NA	29 848	NA	37 128	NA
	2000	62 101	12.7	31 370	5.1	37 147	0.1
	2010	78 882	43.2	41 652	39.5	42 115	13.4
	2015	82 955	50.6	43 775	46.7	44 430	19.7
I-15 to Lake Murray Blvd.	1990	54 112	NA	23 399	NA	31 890	NA
	2000	59 771	10.5	24 271	3.7	31 439	-1.4
	2010	62 842	16.1	26 002	11.1	33 355	4.6
	2015	63 937	18.2	26 413	12.9	33 953	6.5
Lake Murray Blvd. to SR-125	1990	44 367	NA	18 957	NA	27 063	NA
	2000	47 634	7.4	19 238	1.5	26 931	-0.5
	2010	49 229	11.0	19 574	3.3	30 034	11.0
	2015	49 940	12.6	19 557	3.2	31 126	15.0
SR-125 to SR-67	1990	35 946	NA	14 660	NA	22 489	NA
	2000	38 194	6.3	14 746	0.6	22 067	-1.9
	2010	37 461	4.2	14 846	1.3	24 406	8.5
	2015	37 397	4.0	14 901	1.6	25 528	13.5
SR-67 to Greenfield Dr.	1990	69 606	NA	27 278	NA	17 409	NA
	2000	74 488	7.0	74 488	173.1	17 163	-1.4
	2010	72 882	4.7	27 839	2.1	19 716	13.3
	2015	72 922	4.8	28 028	2.7	20 602	18.3
Greenfield Drive To Willow Rd	1990	33 174	NA	12 140	NA	6 668	NA
	2000	38 061	14.7	13 326	9.8	6 614	-0.8
	2010	48 650	46.7	17 649	45.4	7 614	14.2
	2015	54 183	63.3	19 937	64.2	8 287	24.3
Willow Rd to Imperial County	1990	4 364	NA	1 871	NA	634	NA
Line	2000	5 092	16.7	1 936	3.5	568	-10.4
	2010	6 601	51.3	2 712	44.9	666	5.0
	2015	8 709	99.6	3 616	93.3	764	20.5
TOTALS:	**1990**	**347 348**	**NA**	**151 329**	**NA**	**212 029**	**NA**
	2000	**380 603**	**9.6**	**203 139**	**34.2**	**209 074**	**-1.4**
	2010	**420 014**	**20.9**	**179 345**	**18.5**	**231 705**	**9.3**
	2015	**435 502**	**25.4**	**186 286**	**23.1**	**240 752**	**13.5**

Source: SANDAG Series 8 Regional Growth Forecast, May 1995.

Imperial County

The seven incorporated cities of Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial and Westmorland account for three quarters of the total population of Imperial County, and have historically grown at a faster pace than the unincorporated cities. This trend is expected to continue, with a 152.2 percent increase in urban population, versus a 53.9 percent increase in the unincorporated areas, from the 1990 base year to 2015. A 98.1 percent increase in housing stock and a 76.3 percent growth in employment is projected for the County as a whole.

Imperial County is one of the most productive agricultural regions in the world. Agriculture and its related industries employs 35.1 percent of the work force. Government is the second largest employer with 21.3 percent, followed by retail trade with 15.2 percent. Other significant contributors to the local economy include winter visitors, a maximum-security State prison near Seeley, the growing geothermal industry, mining, the second Mexico/USA border crossing at Calexico, and increased trade as a result of the North American Free Trade Agreement (NAFTA).

El Centro

The City of El Centro is situated approximately 193 km (120 miles) from downtown San Diego. El Centro had a 1994 population of 36 717, making it the most populous city in Imperial County. El Centro has historically experienced a relatively slow rate of growth, interrupted by periods of moderate growth. For example, El Centro's population increased an average of 4 percent per year from 1990 to 1994. Population is expected to more than double between 1994 and the year 2015.

El Centro's economy differs somewhat from the rest of Imperial County's agrarian economy. As the County seat, it offers a substantial amount of public-sector employment. City, county, State and federal government offices are located downtown. El Centro's economy is dominated by professional and related services (approximately 30 percent of the workforce), followed by retail trade and public administration.

Holtville

The City of Holtville is located 13 km (8 miles) east of El Centro. Holtville had a 1994 population of 5 576, and experienced an annual average population increase of 4 percent from 1990 to 1994. It is expected to grow at just half the pace of El Centro.

Unincorporated Areas

The unincorporated areas along the I-8 corridor in Imperial County include the recreation/retirement community of Ocotillo, just east of Anza-Borrego Desert State Park, the agriculture-based communities of Heber and Seeley, and Winterhaven along the Colorado River. Population in all the unincorporated

areas of Imperial County grew by 20.6 percent from 1990 to 1994, and is expected to grow by another 27.6 percent by the year 2015. Housing from 1994 to 2015 is expected to increase by 28.3 percent, while employment is to increase disproportionately by 61.9 percent.

Table 8 displays current and projected population, housing and employment growth for selected jurisdictions within Imperial County.

TABLE 8
POPULATION, HOUSING AND EMPLOYMENT GROWTH
SELECTED JURISDICTIONS - IMPERIAL COUNTY

Location	Year	Total Population	% Change from Base Year	Total Households	% Change from Base Year	Total Employment	% Change from Base Year
El Centro*	1990	31 384	NA	9 633	NA	13 676	NA
	1994	36 717	17.0	10 623	10.3	15 393	12.6
	2000	49 605	58.1	13 164	36.7	16 949	23.9
	2010	69 688	122.0	18 403	91.0	21 398	56.5
	2015	78 264	149.4	20 663	114.5	23 752	73.7
Holtville*	1990	4 820	NA	1 422	NA	4 800	NA
	1994	5 576	15.7	1 544	8.6	5 352	11.5
	2000	6 515	35.2	1 837	29.2	5 721	19.2
	2010	7 361	52.7	1 903	33.8	7 029	46.4
	2015	8 261	71.4	2 137	50.3	7 802	62.5
Calexico	1990	18 633	N/A	4 729	N/A	6 829	N/A
	1994	23 708	27.2	5 652	19.5	7 418	8.6
	2000	31 112	67.0	7 148	51.2	8 985	31.6
	2010	40 328	116	9 396	98.7	11 683	71.1
	2015	45 291	143	10 549	123	12 968	89.9
All Unincorporated	1990	27 360	N/A	8 824	N/A	7 669	N/A
	1994	32 984	20.6	9 578	8.5	9 408	22.7
	2000	34 786	27.1	10 219	15.8	11 368	48.2
	2010	37 713	37.8	11 007	24.3	13 878	81.0
	2015	42 101	53.9	12 290	39.3	15 227	98.6

*Source: Imperial County Association of Governments (IVAG), 3/14/96

Yuma, with a population of 60 500 is one of the fastest growing metropolitan areas in the United States. The Yuma Metropolitan Statistical Area (MSA) experienced population growth of 19.4 percent from 1990 to 1994. Yuma County's population grew 13.3 percent between 1990 and 1995, from 106 895 to 121 097, and is expected to grow another 52.8 percent between 1995 and the year 2015, to a total of 185 000 residents.

The $1,200,000 Yuma economy is based primarily on tourism, agriculture and the military. The tourist business is composed mainly of cross-country travelers, winter visitors and shoppers from Mexico, and yields an estimated gross revenue of $368,000,000. Agricultural activity in Yuma County produced a harvest of over 67 200 hectares (166,000 acres) and 117 000 pen fed cattle in 1993. Military facilities and wildlife refuges occupy well over half of Yuma County's 14 244 square kilometers (5,500 square miles). The Marine Corps Air Station and Yuma Proving Grounds contribute substantially to the local economy, as do the thousands of retirees. Two large maquiladora assembly plants have been recently constructed on the Mexican side of the border.

The peak season Average Daily Traffic (ADT) on I-8 just east of the State Line is expected to more than triple, from 15 000 vehicles in 1995 to 50 000 vehicles in 2015. Traffic volumes in the City of Yuma subareas vary seasonally from 28 percent to as much as 104 percent due to winter tourism and the harvesting of crops.

Major Development Projects

Proposed major developments that will generate at least 2 000 daily trips are shown in Table 9. Smaller projects that have the potential to create cumulative impacts to I-8 and area surface streets are not shown.

TABLE 9
TRIP INDUCING MAJOR DEVELOPMENT PROJECTS (I-8 CORRIDOR)

Segment	Proposed Development	Commercial m^2 (sq. ft.)	Dwelling Units	Hectare (Acreage)	Trips Generated Daily
3	Fashion Valley Expansion	40 876 (440,000)		33.0 (81.6)	32 300
4	Park in the Valley		300	12.8 (32)	31 400
5	Stadium Expansion	10 600 seats			2 320
7	La Mesa Gateway Center	21 135 (227,500)		7.9 (19.5)	14 460
10	Los Coches/Walmart	26 477 (285,000)	200	152.6 (377.0)	22 040
12	Stagecoach Ranch		134	148.0 (365.8)	2 748
18	Heber Ranch	24 154 (260,000)	2983	246.5 (609)	80 100
18	Tract 903 - Abatti		221	19.1 (47.3)	2 220
18	Heberwood Estates	20 029 (215,600)	850	64.8 (160)	12 244
18	Villa Park Subdivision		224	23.1 (57.2)	2 840
18	County Services Bldg.	6 689 (72,000)			2 400
18	Countryside Subdivision - Area B		330	33.3 (82.2)	3 300
18	Countryside Subdivision - Area C		640	16.1 (39.9)	6 400
19	Calexico Regional Mall	33 444 (360,000)		61.5 (152)	33 800

Source: District 11 Planning Studies Branch, County of Imperial

The 1993 Imperial County General Plan Update identifies several Specific Plan Areas (SPA) within the county that could have an effect on future operating conditions on I-8 and other State highway facilities. The intent of the General Plan in regard to the SPA is to ensure that future development occurring within the designated areas is in conformance with the County's General Plan Land Use Element. Any new developments proposed within the SPA must have an approved Specific Plan prior to commencement of development activities. Table 10 lists the SPA most likely to have an effect on future operating conditions of I-8.

TABLE 10
IMPERIAL COUNTY SPECIFIC PLAN AREAS (I-8 CORRIDOR)

Segment	Imperial County Specific Plan Areas	Type of Development
18	Heber SPA	Mixed Use
19	East Border Crossing SPA	Commercial/Retail/Services
19	CM Ranch SPA	Mixed Use
20	Felicity SPA	New Town/Services

Source: County of Imperial General Plan

Additional developments, though only conceptual at this time, that could potentially induce growth include the expansion of the international airport at Calexico, development of the Holtville Air Strip as a super-regional airport hub or as a military facility, and expansion of the Centinela State Correctional facility near Seeley.

TRANSPORTATION CONCEPT (2015)

The components of the 2015 Transportation Concept include State highway, transit service and arterial street improvements, as well as system management,

travel reduction, goods movement, international border, aviation and nonmotorized components. The major State highway improvements are described in Table S-3, while the others are discussed in the Concept Rationale section.

The Transportation Concept for I-8 is shown in Table S-2. This table examines the route in segments based on future route development and traffic analysis, and lists the facility type and the number of lanes for the year 2015, the ADT for 2015, the Peak Hour Demand to Capacity Ratio (D/C) for 2015, the 2015 Peak Hour Operating LOS, and the 2015 Transportation Concept LOS.

The 2015 traffic projections for I-8 are based on Caltrans' traffic forecasts and the SANDAG Series 8 regional population and employment forecasts and assume completion of the future regional transportation system. The 2015 traffic projections are subject to change based on periodic traffic forecasting model adjustments and ongoing supplemental transportation studies.

The 2015 Peak Hour Operating LOS includes all proposed transit, regional arterial and State highway improvements, including HOV facilities. It also includes expansion and greater utilization of the existing arterial street network. Even with these improvements, the 2015 peak hour Operating LOS for Segments 2 through 8 (Midway Drive to SR-67) will be deficient (LOS 'E' or worse). Additional improvements such as the implementation of Transportation Control Measures (TCM), Transportation System Management (TSM) and Transportation Demand Management (TDM) strategies will be needed.

The 2015 Transportation Concept LOS for urbanized facilities within San Diego County is based on the SANDAG Congestion Management Program (CMP). The CMP standard of LOS 'E' is the 2015 Transportation Concept for Segments 1 and 2 and Segments 7 through 12. The CMP standard of LOS 'F_0' is the 2015 Transportation Concept for Segments 3 through 6. For Segments 13 through 16 and 18 through 20, the 2015 Transportation Concept is based on District System Planning LOS guidelines for rural highways. The Transportation Concept for these segments is LOS 'B'. For Segment 17, the Concept LOS is 'D' and is also based on District System Planning LOS guidelines.

The 2015 peak hour Operating LOS is equal to or better than the minimum CMP standard in Segments 1 and 3 and in Segments 9 through 20.

The post-2015 Ultimate Transportation Corridor (UTC) describes the long term (beyond the 20 year planning period) right of way requirements for a particular segment. The long term needs are determined by advanced transportation system plans, general plans, transportation plans, land use plans, environmental documents, and other planning documents. The intent is to take advantage of or develop opportunities for long term right of way acquisition and to work with local and regional agencies to implement corridor preservation measures. The number of lanes and facility type for the UTC are shown in Table 11.

TABLE 11

2015 TRANSPORTATION CONCEPT AND ULTIMATE TRANSPORTATION CORRIDOR

	Segment/ County Post-Mile	Location	No. Lanes/ Facility Type	ADT[1]	Peak Hour D/C	Peak Hour Operating LOS[2]	Concept LOS[3]	U/R	UTC Width
1	SD L0.0 - L1.2	Sunset Cliffs Blvd. to Midway Drive	4F	71 000	0.84	D	E	U	4F
2	SD L1.2 - R0.0	Midway Drive to I-5	4F	120 000	1.16	F_0	E	U	4F
3	SD R0.0 - 2.4	I-5 to SR-163	10F	195 000	0.97	E	F_0	U	10F
4	SD 2.4 - 4.4	SR-163 to I-805	8F	241 300	1.34	F_1	F_0	U	8F
5	SD 4.4 - 5.6	I-805 to I-15	8F	252 000	1.38	F_2	F_0	U	8F
6	SD 5.6 - 9.6	I-15 to Lake Murray Blvd.	10F	235 300	1.27	F_1	F_0	U	10F
7	SD 9.6 - 12.4	Lake Murray Blvd. to SR-125	8F	174 900	1.21	F_0	E	U	8F
8	SD 12.4 - 15.8	SR-125 to SR-67	8F	186 300	1.13	F_0	E	U	8F
9	SD 15.8 - R18.7	SR-67 to Greenfield Drive	8F	111 300	0.90	D	E	U	8F
10	SD R18.7 - R25.7	Greenfield Dr. to Dunbar/Harbison Cyn.	6F	55 700	0.67	C	E	U	8F
11	SD R25.7 - R28.5	Dunbar/Harbison Cyn. to Tavern	6F	44 000	0.53	B	E	U	6F
12	SD R28.5 - R31.3	Tavern to W. Willows (Urban/Rural limit)	6F	35 000	0.33	A	E	U	6F
13	SD R31.3 - R34.3	W. Willows (U/R limit) to E. Willows	4F	42 000	0.31	A	B	R	4F
14	SD R34.3 - R37.8	E. Willows to Japatul (SR-79)	4F	42 000	0.31	A	B	R	4F
15	SD R37.8 - R65.9	Japatul (SR-79) to Ribbonwood (SR-94)	4F	28 000	0.34	A	B	R	4F
16	SD R65.9 - R77.8	Ribbonwood (SR-94) to Imperial Co.	4F	22 500	0.24	A	B	R	4F
17	IMP R0.0 - R37.0	San Diego County Line to Imperial Ave.	4F	18 200	0.20	A	B	R	4F
18	IMP R37.0 - R40.9	Imperial Ave. to SR-111	4F	34 200	0.33	A	D	U	4F
19	IMP R40.9 - R65.8	SR-111 to SR-98	4F	10 700	0.11	A	B	R	4F
20	IMP R65.8 - R97.0	SR-98 to Arizona State Line	4F	22 100	0.22	A	B	R	4F

2C = Two lane conventional highway
4C = Four lane conventional highway
4E = Four lane expressway
4F = Four lane freeway
ADT = Average Daily Traffic
LOS = Level of Service
R = Rural
R/W = Right of Way
U = Urban
UTC = Ultimate Transportation Corridor
V/C = Volume to Capacity

[1] ADT's within San Diego County based on SANDAG Series 8 2015 Build traffic forecasting model, May 95.
[2] 2015 Peak Hour Operating LOS includes provision of State highway and arterial improvements.
[3] Based on SANDAG CMP standards and District 11 System Planning LOS guidelines.

CONCEPT RATIONALE

An intermodal approach, utilizing several different transportation improvement concepts, is used to provide for the projected travel demand in the I-8 corridor and help achieve the 2015 Transportation Concept LOS.

Highway Component

The State highway component of the Concept includes upgrading Segment 3 (I-5 to SR-163) from an eight lane freeway to a ten lane freeway. Upgrading from a six lane freeway to an eight lane freeway is recommended for Segment 9 (SR-67 to Greenfield Drive). Upgrading from a four lane freeway to a six lane freeway is recommended for Segments 10, 11 and 12 (Greenfield Drive to the Urban/Rural Limit at West Willows).

The main lane facility improvements to I-8, along with planned operational and safety improvements, will help ease interregional travel throughout and between San Diego County and Imperial County, improve intercity and international travel between Mexico and San Diego, and facilitate the movement of goods throughout the region.

Additional strategies, including TDM and TSM, such as Park and Ride facilities, should be implemented where appropriate.

Transit Component

The San Diego region has five transit center[1] locations dispersed along the I-8 corridor between Old Town in San Diego and El Cajon. Light rail transit (LRT) lines currently parallel the I-8 corridor from downtown San Diego through Lemon Grove, La Mesa and El Cajon. Extension of the line from downtown into Old Town was completed in June 1996. Further extension of this line into Mission Valley and on to Rancho Mission Road is expected in FY 1998. Additional extension of the line through Mission Valley from Rancho Mission Road to the East Line trolley station at Grossmont Center is proposed.

At the present time in San Diego, there are two express bus service routes providing peak period service to commuters in the I-8 corridor. San Diego Transit Route 270 provides one inbound morning peak period trip from Kearny Mesa/Tierrasanta to downtown San Diego, and one homebound afternoon peak period trip. It utilizes the portion of I-8 from SR-163 to I-15 on its westbound morning trip. An increase to 15 minute peak period service is planned for this route. San Diego Transit Route 40 operates Monday through Friday between downtown San Diego and San Carlos/Fletcher Hills, and utilizes the portion of I-8 from I-805 to Waring Road. It provides five inbound trips from approximately 6:00 A.M. to 8:00 A.M. into downtown San Diego, and six homebound trips on 30 minute headways from approximately 3:00 P.M. to 5:30 P.M. An increase to 15 minute peak period service for Route 40 is planned.

In the event the light rail transit system is not extended east of Rancho Mission Road, an express bus alternative may be implemented. The express bus (Route 980/980X) would operate on I-8 and arterial streets between the Grossmont and Rancho Mission LRT stations, serving bus stations at 70th Street, San Diego State University, and Grantville.

The first “transit by-pass lane” in San Diego was implemented in 1993 on Friars Road in the westbound traffic lanes at the intersection of Friars Road and Frazee Road in Mission Valley.

There are three San Diego County Transit routes operating in the I-8 corridor. Route 864 operates daily on 60 minute headways eastbound from the El Cajon Transit Center to the Viejas Reservation, with 11 buses westbound throughout the day. Improvement to 30 minute peak service is planned for FY 1998. Route 888 operates one round trip per day between Grossmont Center and Jacumba. Route 894 operates one round trip per day between Grossmont Center and Morena Village/Jacumba, via SR-94. All routes provide San Diego Trolley access. Bus service changes will be made to coordinate with the Mission Valley West Trolley extension in FY 1998. A new route from Pine Valley to Alpine is to open in FY 2000.

[1] Transit centers are major off-street passenger stations that are situated at high volume boarding and transfer locations.

The Imperial County Transit System is an intercity fixed route bus system, subsidized by IVAG, managed by the County Department of Public Works, and operated by a private transportation provider.

Imperial County Transit runs one bus per week between El Centro and Winterhaven.

Within Imperial County, no significant transit system expansion in the I-8 corridor is planned through 2015.

Greyhound Bus Lines provides intercity bus service in the I-8 corridor. There are bus stations in downtown San Diego, El Cajon and El Centro. Greyhound runs four buses daily each way between San Diego and Yuma, Arizona. There is one additional bus daily from San Diego to El Cajon, and one additional bus each way between El Centro and Yuma, Arizona.

Currently, there is no passenger rail service between San Diego and Yuma, Arizona along the I-8 corridor.

In a March 1995 study, District 11 explored some of the issues involved in providing new passenger rail service and improved goods movement between Los Angeles and Mexico via Calexico and the Coachella Valley in Riverside County. There was insufficient information to assess the capacity of the existing Union Pacific/Southern Pacific main line between Colton and Niland; and the impact on freight service of increasing the number of passenger trains was not determined. Both bus and air services between Mexico City and Los Angeles were found to be competitive with rail service in terms of frequency, time and cost.

System Management and Travel Reduction Component

Major strategies to increase the operational efficiency of the I-8 facility include greater utilization of the existing and proposed arterial street network in the corridor, increased ramp metering with preferential HOV bypass lanes, the provision of Park and Ride facilities and the use of TCM. The use of HOV lanes was considered, but there is insufficient width in the median of I-8 in the urban area to construct such a facility.

Regional Arterial System

As the freeway system approaches its planned capacity, a supporting regional arterial system becomes increasingly important. In addition to improvements to the State highway facilities, the transportation concept for I-8 calls for greater utilization of arterial street capacity within the corridor. The existing arterial network consists of two and four lane surface streets. Major arterials that parallel or intersect I-8 are listed in Table 12.

TABLE 12
ARTERIAL STREETS IN THE I-8 CORRIDOR

Segment	Arterial Name	Description	I/P*
1-3	Sunset Cliffs Blvd./Sea World Drive	I-8 to Morena Boulevard	I/P
2-6	Friars Road	Sea World Drive to Mission Gorge Road	P
3-7	Washington St./El Cajon Blvd.	Pacific Highway to I-8	I/P
7-9	Fletcher Pkwy./Broadway (El Cajon)	I-8 (La Mesa) to I-8 (El Cajon)	I/P
8-10	El Cajon Blvd./Old Hwy. 80	I-8 (El Cajon) to Dunbar Lane	I/P
15	Old Hwy. 80	SR-79 to Sunrise Highway	I/P
15-16	Old Hwy. 80	Buckman Springs to I-8 (In-ko-pah)	I/P
17	Forrester Road	McCabe Road to SR-78/86	I
17	Austin Road	Lyons Road to SR-86 (near Brawley)	I
17	La Brucherie Road	Kubler Road to Worthington Blvd. (S-28)	I
17	Clark Road	SR-98 to Aten Road	I
18	Dogwood Road	Heber Road to SR-78	I
17-19	Worthington Road	Huff Road to Holt Road (S-32)	P
17-19	Evan Hewes Highway	W. Jct. 1-8 to E. Jct. I-8	P
17-19	Ross Road	Haskel Road to Mets Road	P
17-19	McCabe Road	Silsbee Road to Towland Road	P
17-19	Heber Road	La Brucherie Road to Vencil Road	P
19	Bowker Road	Anza Road to S-80	I
19	Barbara Worth Road	Anza Road to S-80	I
19	Bonds Corner Road	SR-98 to I-8	I

* P = Parallel
I = Intersect

Capacity of existing arterials within the corridor can be affected by physical inadequacies, access conflicts, numerous traffic signals and general congestion. Expansion and improvements to the existing regional arterial system will increase the overall operational performance of the transportation system for shorter, intraregional trips, and in some cases, provide an alternative route for regional trips. Increased capacity can typically be enhanced by realignment and/or widening, correcting physical inadequacies and access conflicts, minimizing side friction, and improving the signalization.

SANDAG coordinated the development of the *1995 Regional Arterial System (RAS) Project Priority List* which includes unfunded/underfunded candidate projects that could compete for future discretionary transportation funding allocations. SANDAG has also developed the *Traffic Signal Optimization Program* (April, 1994). This program was developed to enhance inter-jurisdictional coordination, to provide detailed guidelines for the implementation of a county-wide traffic management system, and to identify a conceptual plan for future implementation of an Advanced Traffic Management System (ATMS), one of several Intelligent Transportation System (ITS) technologies. The proposed signal system improvements are expected to significantly reduce vehicle emissions and traffic congestion. Discussion of the ITS is expanded in a separate section below.

Arterial street improvements have been identified in several documents, most notably the SANDAG 1995 Regional Arterial Candidate Project List, SANDAG 1994 RTIP, the Imperial County Transportation Plan (ICTP) and the SCAG 1993 RTIP. Although the regional arterials provide a continuous network, they remain under the control of the individual cities and counties. The cost to upgrade these facilities may exceed what is available from local revenues; funding sources for these projects may include State and federal highway capital funds.

Table 13 identifies arterial system improvements within or adjacent to the I-8 corridor.

TABLE 13
TRANSPORTATION CONCEPT ARTERIAL IMPROVEMENTS

Segment	Facility	Location	Project Description
	San Diego County		
2	Sea World Drive	W. Mission Bay Drive to I-5	Widen from 4 to 6 lanes
3	Friars Road	Fashion Valley Road to Ulric Street	Widen from 5 to 6 lanes
3-4	SR-163/Friars Road	Ulric Street to Frazee Road	Widen overpass, improve interchange, eliminate weaving conflicts, increase ramp storage capacity
	Imperial County		
17	Forrester Road	McCabe Road to SR-86	Upgrade to 4 lane highway
19	Construct SR-7	SR-98 to I-8	New construction

Source: Caltrans Transportation System Development Plan, County of Imperial General Plan Circulation Element, El Centro General Plan Update EIR, SCAG 1993 RTIP, Imperial County Transportation Plan.

Ramp Metering

Freeway ramp meters are designed to maximize a freeway's full capacity, reduce traffic congestion and accidents, and reduce motorist delays by improving commuter peak period travel times. Metered ramps control the rate at which traffic enters the freeway. In many cases, special lanes are provided on these ramps for carpools, vanpools and buses. Central computer control ramp metering is responsive to real time traffic speeds, volumes and congestion levels, and the metering rate can be adjusted as appropriate. Table 14A lists existing ramp meter locations along I-8, and Table 14B lists I-8 ramp meter locations that are programmed or under construction.

TABLE 14A
EXISTING RAMP METERS IN THE I-8 CORRIDOR

EASTBOUND	WESTBOUND
Southbound Texas Street *	Southbound Waring Road *
Northbound Texas Street	Southbound College Ave
Southbound Fairmount Ave	Northbound College Ave
Northbound Fairmount Ave	Lake Murray Blvd. *
Southbound College Ave	70th Street (Lake Murray/Parkway Dr.)
Northbound College Ave	Fletcher Parkway**
El Cajon Blvd. (Spring St.)	Spring Street
Spring Street	Jackson Drive *
	Severin Drive *
	La Mesa Blvd.
	El Cajon Blvd. *
	West Main Street
	Johnson Ave *
	Mollison Ave
	Northbound Magnolia Ave
	Broadway
	Southbound Route 67 Connector
	2nd Street/Route 54
	Greenfield Dr.
	Los Coches Rd/Camino Canada *
	Northbound Lake Jennings Park Rd *
	Southbound Lake Jennings Park Rd
	Southbound Route 125 *
	Northbound Route 125

* Indicates presence of preferential carpool lane
** Addition of preferential carpool lane is programmed

TABLE 14B
RAMP METERS PROGRAMMED/UNDER CONSTRUCTION IN THE I-8 CORRIDOR

EASTBOUND	WESTBOUND
Eastbound Nimitz Blvd.	Fairmount Ave
Southbound Sports Arena Dr.	
Sports Arena Dr.	
Northbound Magnolia	

It is expected that by the year 2000, all eastbound ramps from Nimitz to El Cajon/Spring Street, and all westbound ramps from Lake Jennings to Taylor Street, will be metered. Freeways and freeway connectors will not be metered. There are currently no plans to meter ramps on I-8 east of Lake Jennings in either San Diego County or Imperial County.

Transportation Control Measures

In April 1991, SANDAG adopted the Regional Transportation Control Measure Plan for Air Quality to reduce traffic congestion and motor vehicle emissions in the San Diego air basin, consistent with State and federal regulations. Tactics

include a commute travel reduction program, a college travel reduction program, a goods movement/truck operation control program, a transportation capacity expansion program, a traffic systems management program, and an indirect source control program. Measures also include staggered employee work hours, parking management, developer and employer incentives and implementation of local ordinances. The TCM are more fully described in the Air Quality Component.

Park and Ride

Park and Ride facilities encourage and support the use of commuter or express transit and car/vanpooling for a portion of longer vehicle trips and consequently reduce Vehicle Miles of Travel (VMT). The location and funding of Park and Ride lots are based on several criteria, including type and size of development, number of trips generated, and proximity to State highways, major arterials and transit services.

There are 11 Park and Ride lots near or adjacent to I-8 at the following locations:

1. I-8 at Taylor Street, San Diego*
2. I-8 at 70th Street (Alvarado Road), La Mesa
3. I-8 at Grossmont Center Drive, La Mesa
4. SR-125 and Grossmont Boulevard, La Mesa
5. I-8 at Fuerte Drive, La Mesa
6. I-8 at Severin Drive, La Mesa
7. Madison Street near East Main Street, El Cajon
8. Greenfield Drive at East Main Street, El Cajon
9. I-8 at Camino Canada, San Diego County
10. I-8 at Lake Jennings Park Road, Lakeside
11. I-8 at Japatul Road, Descanso

* This Park and Ride lot is operating under contract agreement with the City of San Diego.

The lot at Camino Canada will be expanded per a developer agreement. There may also be a Park and Ride lot incorporated into the new Calexico East Port of Entry (POE) facility, which is located 10.5 km (6.5 miles) east of Calexico.

Both the light rail and express bus alternatives under consideration between Rancho Mission and Grossmont Center include new or expanded Park and Ride facilities in the I-8 corridor. For both alternatives, an approximately 250-space Park and Ride lot is proposed in Grantville on Alvarado Canyon Road between Mission Gorge Road and Waring Road. In addition, the existing Caltrans Park and Ride lot at 70th Street would be expanded to approximately 170 spaces south of I-8 and approximately 40 spaces north of I-8 connected via a pedestrian bridge over the freeway. Other Park and Ride facilities west of Rancho Mission associated with the Mission Valley West LRT Line are located at the Morena Station, the Stadium, and the future Mission City Station.

There are currently no other plans to increase the number of Park and Ride facilities in the I-8 corridor.

Goods Movement Component

Goods movement is an essential component of the integrated transportation system. The health, welfare and prosperity of the region's population depends upon the reliable, safe and efficient transport of goods and services. However, the impacts of noise, air quality, land use, congestion and safety must be addressed. In addition, the transportation system must be managed, operated, maintained and improved by considering and balancing the needs of all users. I-8 is considered to be a major goods movement corridor. Although most goods are transported by truck within the I-8 corridor, other modes include rail, ports and shipping, air cargo and pipelines.

San Diego County

The San Diego County economy has traditionally relied primarily on the military and aerospace industries. However, greater contributions are now being made by biotechnology, research and development, tourism and health services. Agriculture remains a strong industry. Nearly all of the associated goods movement is accommodated by trucking. The truck percentage of ADT on I-8 in San Diego County varies between 1 percent (Sunset Cliffs to I-5) and 12 percent (east of Junction SR-79 to the Imperial County Line); truck volume peaks in the center of the metropolitan area, between SR-163 and I-15, with a volume of 7290 trucks. (Please refer to Figure 2 on Page 24a.)

East-west rail service from the San Diego area currently bypasses the I-8 transportation corridor. Eastbound rail freight must first travel north into Orange County and San Bernardino County. From there it can continue eastward through Barstow or transfer to Union Pacific/Southern Pacific Rail to Calexico or Yuma. (See discussion below.)

San Diego International Airport at Lindbergh Field is a major freight intermodal facility which accesses the I-8 corridor. Trucks haul the air cargo to and from the facility; there is no rail access. In 1994, total air freight volume at San Diego was 64 697 metric tons (71,167 short tons). Most of the domestic air freight market today is mail or small/lightweight packages with local origins and destinations. Domestic heavyweight cargo is transported almost entirely by surface modes. San Diego's ability to compete for heavyweight air cargo is limited because it has virtually no wide body service (28 weekly), and because it provides no direct international air cargo service without going through Los Angeles or another major airport.

Caltrans District 11 conducted an origin/destination truck survey at the Port of San Diego in November 1992. It was determined that the air cargo facility

generated 412 truck trips per day[1]. Approximately five percent of the trips had origins or destinations outside of San Diego County; 71 percent of the trip origins and 68 percent of the trip destinations remained within the San Diego metropolitan area. Consequently, the highest concentration (ten percent to 15 percent) of these trucks on I-8 utilized Segment 3, between I-5 and SR-163, and fewer than five percent of these trucks drove on I-8 east of I-15.

Air cargo volume at San Diego has been increasing at an annual rate of 14 percent in recent years. This primarily reflects San Diego's low baseline level of air cargo volume. Because of its low proportion of air cargo to population and passenger traffic, is estimated that at least 80 percent of San Diego's domestic air freight is actually accommodated by other southern California airports -- primarily Los Angeles and Ontario.

There remains the possibility that the airport will be relocated in order to facilitate the growing passenger demand. Opportunities for future expansion of the airport in its present location are limited, as Lindbergh Field is an urban-situated facility with one runway. To help meet air travel demand in the airport's current location, the Port District has implemented the Immediate Action Plan. Construction is underway to add an eight-gate concourse to the West Terminal, construct 6224 square meters (67,000 square feet) of new jet taxiways and parking areas around the West terminal and improve street access. This is designed to increase the airport capacity from about 12 million passengers per year to approximately 14.7 million air passengers per year. The increase in air freight capacity would be incidental.

The Tenth Avenue Marine Terminal within the Port of San Diego accommodates ship, rail and truck intermodal activity. Approximately 727 000 metric tons (800,000 short tons) of cargo were shipped through this terminal in 1994. The mode split in 1993 was approximately 90 percent truck and ten percent rail. The share of rail freight has increased since then with the addition of the port's contract to haul mineral products from the Mojave Desert. The primary products trucked consist of newsprint, fertilizer, canned tuna, cement, grain and breakbulk goods. The 1992 traffic survey found that the terminal generates 338 truck trips per day. Nearly two-thirds (66 percent) of the trucks originated in San Diego County; 45 percent originated in the City of San Diego. Nearly three-quarters (74 percent) of the trucks had destinations within San Diego County; 60 percent stayed within the City of San Diego. Between ten and 15 percent of the trucks from this terminal utilize I-8 between I-5 and SR-163. Between five and ten percent of the trucks utilize I-8 east of I-15.

Generally fewer than five percent of the trucks from the National City Marine Terminal drove on the I-8 facility, demonstrating very little impact. This terminal was found to generate 785 truck trips per day. The primary products shipped through this facility are automobiles and lumber.

[1] The air cargo figures do not include the air mail facility, which generates 172 trucks a day. Approximately half of these trucks carry mail to the main post office using only City of San Diego streets. In addition to transporting air cargo, trucks are also needed to service the airport facility itself, particularly for the air catering business and airport concessions.

Imperial County

Imperial County is a one of the nation's most productive agricultural areas, with gross revenues for agricultural commodities of over one billion dollars. Major crops include cotton, sugar beets, alfalfa, safflower, lettuce and vegetable crops such as asparagus, broccoli and carrots. In addition to growing crops, cattle feeding activities yield revenues of more than $220 million. While Imperial County's mild climate permits year-round growing, crops are harvested and shipped during seasonal peak periods.

The vast bulk of Imperial County agricultural products are shipped to Los Angeles for processing and distribution throughout the country. Most of these products are shipped by truck; SR-86 is the principal route.

However, I-8 remains an important goods movement corridor because the San Diego region is itself a strong market for Imperial County agricultural products, and in turn provides needed agricultural supplies.

Truck volume on I-8 in Imperial County peaks between the eastern junction of SR-98 and SR-86, with a volume of 2721 trucks. However, trucks represent approximately 20 percent of the ADT between the eastern junction of SR-98 and the Arizona State Line. (Please refer to Figure 2 on the next page.

A truck scale facility is located on I-8 near Winterhaven. A new Weigh-In-Motion bypass system is planned for this site. This will enable certain transducer-equipped trucks to avoid stopping at the scale, and quite possibly obtain clearance from the nearby Agricultural Inspection Station at the same time.

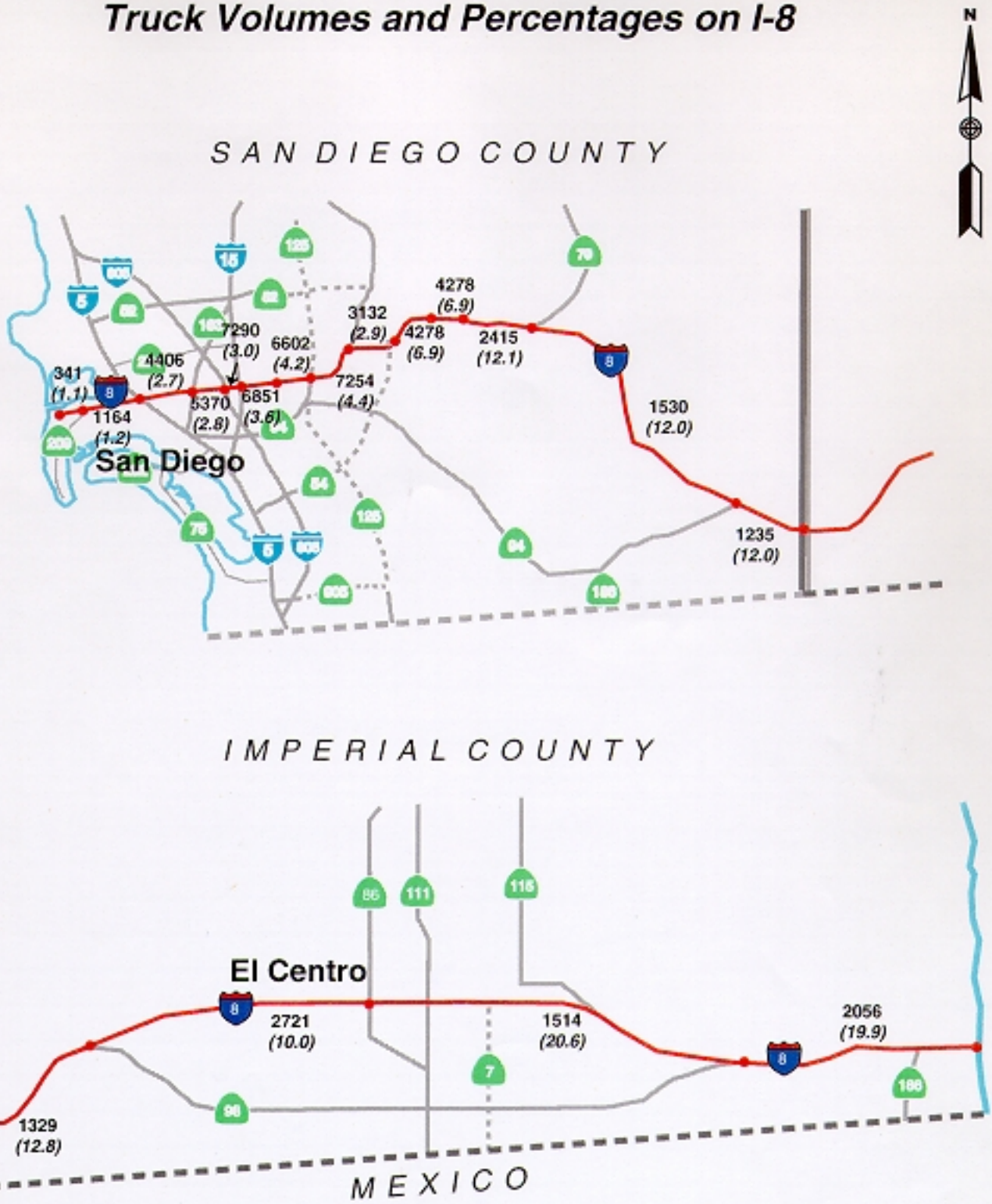
The primary freight rail operator in the region is the Union Pacific/Southern Pacific Railroad. The rail line links the Los Angeles area with Yuma, Arizona and beyond to the eastern United States. A branch line at Niland links to the existing U.S./Mexico International Border POE at Calexico for goods being shipped into and from Mexico.

The San Diego and Arizona Eastern (SD&AE) railway used to provide an east/west rail connection between San Diego and Imperial County. However, the SD&AE rail line has been closed east of Carrizo Gorge since 1983 due to the condition of several tunnels and trestles damaged by fire, flooding and cave-ins. Therefore, freight rail activity within the SD&AE rail corridor is currently limited to the San Diego/Tijuana/Tecate area. SANDAG recently completed an economic feasibility study of the repair and rehabilitation of the SD&AE line from Carrizo Gorge east to Plaster City. Funding is now being sought to reopen and improve the line.

However, it is unlikely that restoration of the rail line would displace many of the truck trips between San Diego and Imperial County that are currently being made on I-8. Instead, the implementation of rail service itself would increase the transportation demand by expanding market opportunities in San Diego, Imperial County and Mexico, and the restored rail service would accommodate the increased demand. Existing interregional truck trips would not be diminished

Figure 2

Truck Volumes and Percentages on I-8



LEGEND

0000	Truck Volume
(00.0)	*Truck Percentage of Total Vehicles*

Source: 1994 Annual Average Daily Truck Traffic on the California State Highway System, Caltrans, September 1995.

Caltrans District 11
System Planning Branch
November1996

Not to Scale

because trucking is usually more cost-effective than rail for trips of less than about 500 miles. It is more cost-effective to truck the fresh fruits and vegetables from the Valley to customers in San Diego and Tijuana who are geographically disperse and without good rail access. However, rail service can compete successfully for large bulk commodity shipments that are destined for a single location, such as a port. Examples of potential rail freight in Imperial County include gypsum and sudan grass. Potential rail cargo from the Port of San Diego includes cement destined for the distribution center in El Centro, livestock feed grains needed by Imperial County cattle growers and imported automobiles for delivery to the southwestern U.S.

Liquid Petroleum (LP) products are carried through Imperial County via the 50.8 cm (20 inch) Santa Fe Pacific Pipe Line. It is generally located within the Union Pacific/Southern Pacific right of way. Southeast of Ogilby, the line turns east and travels to Yuma. Parallel to I-8, a 15.2 cm (six-inch) branch line distributes gas to the storage facility south of Imperial, and a 10.2 cm (four-inch) line serves the Naval Air Facility near Seeley.

In addition to agricultural shipments and the LP pipeline, the Union Pacific/Southern Pacific railroad line may be used in the future as right of way for geothermal pipelines to industrial plants in El Centro.

Natural gas is delivered by the Southern California Gas Company via twin 25.4 cm (ten-inch) lines. Like the LP line, the main line runs north-south serving communities from Niland to Calexico. East-west branch lines within the I-8 corridor serve Holtville, Seeley, the Naval Air Facility and Plaster City.

International Border Component

In southern California, primary goods movement routes for U.S./Mexico trade are located between Tijuana and Los Angeles through San Diego, and between Calexico/Mexicali and Los Angeles. In Imperial County, the trucks generally head north-south on SR-86. The rail freight is also oriented north-south through Imperial County on the Union Pacific/Southern Pacific rail line as previously discussed. The restoration of the SD&AE line to connect with the Union Pacific/Southern Pacific line would give the San Diego region good rail access to Mexico's interior. The Union Pacific/Southern Pacific line runs along the entire 3 200 km (2,000 mile) border and connects to the Mexican railroad at multiple locations.

The U.S./Mexican Border contributes a modest volume of trucks to the I-8 corridor. In 1993, Caltrans District 11 conducted a truck origin/destination survey at four POEs: San Ysidro, Otay Mesa, Tecate and Calexico. The Calexico POE processed approximately 1100 trucks per day. About 8.0 percent (90) of these trucks had origins or destinations in Imperial County; 8.5 percent (100) had origins or destinations in San Diego County; and three and three-tenths percent (40) had origins or destinations in Arizona. Of the approximately 2300 trucks per day at the San Diego County POEs, 15.4 percent (350) had

origins or destinations in San Diego; fewer than one percent had origins or destinations in Imperial County.[1]

Similarly, border trade activity near Yuma, Arizona most likely has only a minor impact on I-8 west of Yuma. The majority of trade activity is to major markets in the midwest and eastern seaboard in the United States and eastern Canada.

In future plans, the major north-south transportation corridor between the new Calexico POE and SR-86 into Riverside County will utilize only a small segment of I-8. SR-7, a recently completed four lane conventional highway, now connects the POE to SR-98, and will open by early 1997 upon completion of the Mexican federal POE. Construction of the second segment of SR-7 from SR-98 to I-8 could begin in 2001. Traffic will head west on I-8 to SR-111, turn north onto SR-111 to the future Brawley Bypass (SR-78), then access SR-86 to continue into Riverside County and beyond. Traffic forecasts project that by the year 2015, nearly 30 000 vehicles, including 15 percent trucks, will traverse this route daily.

A new and technically sophisticated Commercial Vehicle Enforcement Facility (CVEF) has been constructed and will begin operations along with the new POE. The CVEF will facilitate the inspection of trucks entering the United States for compliance with various laws and regulations including weight, vehicle maintenance, licensure and air quality.

Because of the passage of the North American Free Trade Agreement (NAFTA), numerous planning studies are underway related to transborder transportation and goods movement activities. The current rate of travel and trade growth is expected to substantially increase under NAFTA, but at this time it is difficult to estimate the amount. There are a number of policy and implementation issues that have yet to be resolved. Any increase in border trade could potentially result in a higher truck volume on I-8, depending on commodity type and market availability.

Aviation Component

Although the Aviation Component is not as critical to the 2015 Transportation Concept as the other modal options, ground access issues to and from airport facilities could have an impact on the State highway system. I-8 provides access to the Jacumba Airstrip in San Diego County, a publicly-owned general aviation facility with approximately 3000 annual operations. I-8 also provides access to the Naval Air Facility in El Centro, which supports military operations. There is a small private airport in the I-8/SR-94 vicinity.

A list of aviation facilities located alongside the I-8 corridor indirectly accessible via I-8 is provided in Table 15 below:

[1] Figures are approximate based on a five-day week.

TABLE 15
Aviation Facilities

Airport Facility	Access	Ownership	Type of Use
San Diego International Airport	I-5	San Diego Unified Port District	Commercial
Montgomery Field	SR-163	Public	General
Gillespie Field	SR-67	Public	General
Calexico International Airport	SR-111	Public	Commercial
Gral Sanchez Taboada (Mexicali Int'l.)	SR-111	Mexico (federal)	Commercial
Holtville Airfield	SR-115	Public	General
Imperial County	SR-86	Public	Commercial

ASA = Aeropuertos y Servicios Auxiliares is the Mexican counterpart of the U.S. Federal Aviation Administration (FAA)

In addition, Yuma International Airport is a joint-use civilian and military use airport. Its 4 054 meter (13,300 feet) runway can accommodate all aviation traffic, and allows for the international movement of freight.

Non-Motorized (Bicycle)

Bicycle travel is allowed on all State expressways and conventional highways unless specifically prohibited by appropriate signage. While bicycles are generally prohibited from freeways, some freeway shoulders are also open for bicycles when alternative bike routes are not available. Bicycles are permitted on the following segments of I-8:

TABLE 16
Freeway Segments Open to Bicycle Travel

Segment	Location
14	East Willows Road to Japatul Road (SR-79)
17	In- Ko- Pah Road to Imperial Highway
20	Gordon Wells Road to SR-186

Regional corridor bikeways exist within the I-8 corridor along major arterials from Sunset Cliffs Boulevard to approximately SR-125. Bikeways continue eastward from Greenfield Drive on Olde Highway 80. Future bikeways are planned along East Main Street in El Cajon, along Second Avenue, and along Navajo Road. San Diego Transit operates bicycle rack-equipped buses between Sunset Cliffs Boulevard and the College area in San Diego. The San Diego Trolley runs a similar program between downtown San Diego and El Cajon. Caltrans has installed bike lockers, racks and ring posts at the Park and Ride lots and a number of Trolley stations. The following Bike and Ride lots and transit stations have bicycle lockers and are located adjacent to the I-8 corridor:

TABLE 17
Bicycle Lockers (I-8 Corridor)

Facility	Location
San Diego State University	San Diego
Spring Street Trolley Station	La Mesa
Grossmont Trolley Station	La Mesa
Amaya Drive Trolley Station	La Mesa
El Cajon Transit Terminal	El Cajon
Washington Park & Ride Lot	El Cajon

The Bicycle Element of the SANDAG 1994 Regional Transportation Plan identifies over 600 miles of bicycle facilities available for use. One of the two Element objectives is to increase the miles of bikeways a minimum of 50 miles per year through the seven-year Bikeway Program period. The other objective is to increase the average number of daily bicycle trips from approximately 250 000 to 600 000 in 2015, which would increase the bicycle modal split from 2.5 percent (1994) to 3.5 percent (2015). The priorities for funding new facilities are to fill in gaps and fix bottlenecks on otherwise safe routes that have high usage, to access high use activity centers and transportation centers and to connect to longer routes to improve regional continuity. Some of the other strategies include: Education to encourage people to change from automobile travel to bicycle travel; employer subsidies for bicycle travel; publication of Regional Bike Maps; and installing bicycle sensitive loop detectors at appropriate traffic signals on major bicycle routes.

The Regional Mobility Element of Southern California Association of Governments' (SCAGs) 1994 Regional Transportation Plan contains a Non-Motorized Action Program for the sub-regions, aimed toward establishing a non-motorized network providing safe and convenient access to activity centers and transit centers. To this end, IVAG is coordinating with SCAG to develop non-motorized maps and plans. The program is to contain bicycle parking, bicycle- and pedestrian-friendly roadway features such as lighting, bicycle sensitive loop detectors and audible crosswalk signals, amenities such as shower and locker facilities, safety programs, promotional programs and enforcement programs.

The Circulation Element of the Imperial County General Plan includes a bicycle facilities program designed to provide an integrated bicycle circulation system. On-street bicycle lanes are to be included in appropriate prime, major and secondary arterials. The General Plan Circulation Element for the City of El Centro also includes a system of bicycle lanes and routes to accommodate bicycle commuters and students.

It should be noted that the use of bicycle facilities within the I-8 corridor in Imperial County in most cases is limited to three seasons due to the temperature extremes prevalent in the region in the summertime.

AIR QUALITY

Table 18 identifies the pollutant types, current attainment status and, if currently non-attainment, the time frames for reaching attainment of the National Ambient Air Quality Standards (NAAQS) for the air basins that encompass the I-8 corridor.

TABLE 18
AIR QUALITY ATTAINMENT STATUS (I-8 CORRIDOR)

Area	Pollutant Type Attainment Status (Attainment Year)			
	Ozone	**CO**	**NO_2**	**PM_{10}**
San Diego County (SDAPCD)	State: Serious (1999) Federal: Serious (2005)	Non-attainment	Attainment	Attainment
Imperial County (ICAPCD)	Transitional	Attainment	Attainment	Non-attainment

Ozone (O_3)= [Reactive Organic Compounds (ROC)+Nitrogen Oxide(NOx)+Sunlight]
CO= Carbon Monoxide
NO_2= Nitrogen Dioxide
PM_{10}= Suspended particulate matter less than 10 micrometers in diameter

San Diego County

The San Diego region's air basin was originally designated as a non-attainment area for ozone (O_3) and classified as "severe" under both the State and federal Clean Air Acts. In July 1993, the federal government lowered San Diego's classification to "serious;" however, the State classification remained severe until recently when it was also lowered to "serious" by the State Air Resources Board. The San Diego region's air basin is not expected to be in attainment with State and federal air quality standards until 1999.

California has submitted a request to the Environmental Protection Agency (EPA) for redesignation of San Diego from non-attainment to attainment for carbon monoxide (CO). EPA is currently reviewing this proposal and has taken no action to date.

The 1988 California Clean Air Act (CCAA) requires the development of a new air quality plan from air districts that did not attain the State's standards in 1987. The San Diego County Air Pollution Control District (APCD) adopted the Regional Air Quality Strategy (RAQS) in June 1992. The plan incorporates strategies directed at reducing pollutants and increasing vehicle occupancy in an effort to achieve the State's standards in the region. The RAQS will be implemented by the San Diego Air Pollution Control Board, Caltrans, SANDAG, the transit operators and the cities of this region.

As part of the RAQS, SANDAG has developed transportation related strategies towards attainment of the plan's goals. These strategies are composed of TCM programs planned to achieve the following requirements of the CCAA: A one and four-tenths minimum average vehicle occupancy during weekday commute hours by 1999, no net increase in emissions relative to population growth after 1997, and contribute to the required reduction in District-wide emissions of 5

percent per year, averaged every consecutive three-year period. The four measures of the TCM program and their tactics and elements are summarized in outline form below. A more detailed discussion of each measure follows the outline.

TRANSPORTATION CONTROL MEASURES PROGRAM SUMMARY

1.0 TDM MEASURE

- 1.1 Commute Travel Reduction Program Tactic
  - A. Employment Trip Reduction Program and Ordinance
  - B. Ridesharing Program Element
  - C. Parking Management Program Element
  - D. Telecommuting Element
  - E. Compressed Work Week Element
  - F. Employer Transit Subsidy Element
  - G. Flexible Work Hours Element
  - H. Staggered Work Hours Element
- 1.2 College Travel Reduction Program Tactic
  - A. Travel Reduction Program and Ordinance Element
  - B. Student Transit Pass and Subsidy Element
- 1.3 Goods Movement/Truck Operation Program Tactic
  - A. Goods Movement/Truck Travel Reduction Ordinance Element
  - B. Incident Management and Prevention Program Element
  - C. Motorist Information System Element
- 1.4 Non-Commute Travel Reduction Program Tactic

2.0 TRANSPORTATION CAPACITY EXPANSION MEASURE

- 2.1 Transit Improvements and Expansion Program Tactic
- 2.2 Vanpool Program Tactic
- 2.3 HOV Lanes Tactic
- 2.4 Park and Ride Lot Facilities Tactic
- 2.5 Bicycle Facilities Tactic

3.0 TRAFFIC SYSTEMS MANAGEMENT MEASURE

- 3.1 Traffic Flow Improvements Tactic

4.0 INDIRECT SOURCE CONTROL (ISC) MEASURE

1.0 TDM Measure

The goal of the Commute Travel Reduction Program Tactic is to reduce transportation source emissions by increasing the vehicle occupancy to an average of one and one-half per vehicle during peak weekday periods by 1999.

The Ridesharing Program element provides for the establishment of Transportation Management Associations (TMA's) to encourage employees to commute by alternative modes. The downtown San Diego TMA borders the I-8 corridor.

The second tactic, the College Trip Reduction Program and Ordinance, is designed to have a similar impact on congestion relief as the Commute Travel Reduction Program.

The first two elements of the third tactic, the Goods Movement/Truck Operation Program, are intended to reduce truck travel and to prevent and manage truck accidents.

The third element of the Goods Movement/Truck Operation Program, as it relates to congestion relief, is the provision of the Motorist Information System. Consistent with the goals of the element, the District 11 Long Range Operations Plan (LROP) proposed a Transportation Management Center (TMC), soon to be operating as a 24-hour TMC. It will further aid rapid identification of accidents and other non-recurrent freeway congestion and will issue appropriate information to motorists through the use of changeable message signs, highway advisory radio, and possibly by the use of in-vehicle computers.

The fourth tactic in the proposed TDM measure is the Non-Commute Travel Reduction Program. This program will educate drivers on ways to reduce or change the use of their automobiles with a goal of reducing auto emissions. The programs goal is a reduction equivalent to one trip per day per driver.

2.0 Transportation Capacity Expansion Measure

The second major TCM measure is the Transportation Capacity Expansion Measure. The purpose of the Transportation Capacity Expansion Measure is to reduce VMT in the region. The Transportation Capacity Expansion Measure consists of five tactics. They are (2.1) the Transit Improvements and Expansion Program, (2.2) the Vanpool Program, (2.3) HOV Lanes, (2.4) Park and Ride Lot Facilities, and (2.5) Bicycle Facilities. Detailed information on Park and Ride Lots within the I-8 corridor is contained in the System Management and Travel Reduction Component. Bicycle facilities within the I-8 corridor are discussed in the Non-Motorized Component.

3.0 Traffic Systems Management Measure

The goal of the Traffic Flow Improvement Tactic is to improve the flow of traffic through the coordination of traffic signals and computerized signal controls and to achieve a 10 percent increase in speed on arterial streets by the year 2000. The LROP recommends that a plan be prepared for the systematic review of all signalized intersections on State highways. This plan will include a discussion of signalized local parallel routes.

SANDAG has developed the *Traffic Signal Optimization Program* (April 1994). This is discussed further in the System Management and Travel Reduction Component.

4.0 Indirect Source Control (ISC) Measure

The fourth major TCM measure is the ISC Program. The purpose of the program is to reduce the emissions of motor vehicles associated with land uses identified as indirect sources. The controls will employ TCM and land use measures to attain the air quality goals.

Imperial County

The only pollutants for which federal and/or State air quality standards have been exceeded in the South East Desert Air Basin (SEDAB) area are ozone (O_3) and suspended particulates (PM_{10}). The standards for O_3 are exceeded only a few times a year in Imperial County. The regional emissions from within the SEDAB area do not significantly affect the regional air quality. However, pollutants from the South Coast Air Basin (SCAB), which is composed of the non-desert portions of Los Angeles, San Bernardino, and Riverside Counties, and all of Orange County, are transported via prevailing winds into the SEDAB area.

PM_{10} generators that impact Imperial County air quality include: Wind erosion of cultivated cropland, travel on unpaved roads both in the U.S. and in Mexico, field burning, refuse burning in Mexicali, Mexico, travel on paved roads and construction activities.

Recommended Control Strategies for PM_{10} were developed as part of the 1993 State Implementation Plan (SIP). They were developed from EPA guidance documents, data on control measure studies, and from consultation with staff from the Imperial County Air Pollution Control District (APCD), Imperial County Department of Public Works, Imperial Irrigation District, Caltrans and the U.S. Department of Agriculture Soil Conservation Service. Groups of recommended control measures, or control strategies, were compiled based on feasibility for use in Imperial County. Control strategies were recommended for sources of four major categories of PM_{10} emissions: (1) wind erosion; (2) unpaved roads; (3) paved roads; and (4) construction activities.

The net control efficiency of each strategy was estimated by considering the control measure efficiencies, the percent of the total source category subject to control (based on area, VMT, etc.), and the actual percentage of the total source category targeted for control.

PM_{10} Control Strategies For Imperial County

Emission Source	Control Strategy	Net Control Efficiency
Wind Erosion	Restrict off-road vehicle use. Establish dust controls for storage piles. Reduce silt content of unpaved areas by paving or graveling.	0.2%
Unpaved Roads	Require busing of farm workers. Prohibit unauthorized vehicles on Imperial Irrigation District canal roads. Reduce silt content of unpaved roads by paving or graveling. Lower vehicle speed limits.	32.2%
Paved Roads	Resurface damaged roads. Improve unpaved shoulders/medians, and offramps to adjacent roads. Reduce mud/dirt carryout by cleaning paved roads, paving access roads, installing bed liners and covering haul trucks.	74.1%
Construction	Require dust control plans for construction or land clearing projects including chemically treating or paving inactive sites, cleaning paved roads and carryout sites, installing bed liners, covering haul trucks, and using wet suppression for material storage and handling.	50%

Source: 1993 State Implementation Plan (SIP)

The South Coast Air Quality Management District (SCAQMD) has developed the SEDAB Air Quality Management Plan. The plan contains a number of possible TCMs with the goal of achieving a six percent reduction in VMT.

Under this umbrella Plan, SCAG has proposed no specific TDM strategies for implementation within Imperial County.

INTELLIGENT TRANSPORTATION SYSTEM (ITS)

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) calls for the creation of an economically efficient and environmentally sound transportation system that will move people and goods in an energy efficient manner. This can no longer be done by simply adding to the existing highway system. The Intelligent Transportation System (ITS) offers the potential to improve safety and efficiency in nearly every function of our complex multi-modal transportation system by applying a broad range of diverse technologies. The U.S. Department of Transportation has defined an Intelligent Transportation Infrastructure (ITI) Program consisting of traffic detection and monitoring, communications and control systems required to support a variety of ITS products and services.

New Technology

ITI/ITS Programs offer the potential to deploy and operate traffic signal control systems, freeway management systems, transit management systems, incident management systems, electronic fare payment systems, electronic collection systems and multi-modal traveler information systems.

Under the ISTEA ITS Program, four transportation corridors in the nation have been selected in order to showcase coordinated intelligent transportation system elements. One of the priority corridors selected is the Southern California Intelligent Transportation Systems Priority Corridor. This corridor lies within the major urbanized and adjacent non-urbanized areas of Ventura, Los Angeles, San Bernardino, Riverside and San Diego Counties and all of Orange County. In San Diego, I-15 is included as part of the corridor.

ITS activities in the San Diego region include the innovative use of the existing solar powered freeway call box infrastructure, the development of a multifunctional/multimodal Transportation Management Center (TMC), the provision of automated traffic operation information to fleet operators in the goods movement, transit and hazardous material industries, and the development of an ITS International Border Crossing Operations Strategic Plan. Additional ITS technologies that could be utilized in the San Diego region include changeable message signs and television roadway monitoring devices.

Another related new technology is the future provision of an Automated Highway System (AHS). The ISTEA of 1991 mandated development of an automated highway and a vehicle prototype from which future fully automated intelligent vehicle highway systems can be developed. Caltrans is a core member of The National Automated Highway System Consortium (NAHSC), which was formed to specify, develop and demonstrate a prototype of a working AHS in the United States by 2001. AHS technology will consist of at least two major subsystems, including vehicles and infrastructure. AHS will showcase features such as adaptive cruise control, object detection, collision warning and avoidance systems, longitudinal and lateral vehicle control, maneuver coordination and navigation systems. The specifications will provide for evolutionary deployment that can be tailored to meet regional and local transportation needs. The

consortium will seek opportunities for early introduction of vehicle and highway automation technologies to achieve timely benefits for all surface transportation users.

Congestion Pricing Studies

An additional strategy that should be studied in the future is congestion pricing, which is a direct market incentive to ensure that transportation system users pay the "real" costs of the transportation benefits they receive. One purpose of congestion pricing is to reduce travel demand. With the advent of technological advances such as Electronic Toll Collection and Traffic Management (ETTM) and Automatic Vehicle Identification (AVI) systems, congestion pricing could be developed for a wide variety of transportation facilities.

ISTEA provides funding of up to $25 million annually over the 1992-97 period to support federal participation in congestion pricing pilot programs. SANDAG was awarded a federal technical assistance grant from the Federal Highway Administration (FHWA) for a two-phased pilot program which will allow single occupant vehicle drivers to “buy-in” to the existing I-15 reversible HOV lanes. The intent of this pilot program is to test market-based roadway pricing concepts to better manage traffic congestion and air quality in the region, while raising revenues for the expansion of transit services and HOV facility improvements.

COMPARISON OF CONCEPTS

The purpose of this section is to compare alternative concepts that were considered. In this case the 1990 Route Concept Report (RCR) Concept for the year 2010 is compared with this 1996 TCR for the year 2015.

Table 19 is comprised of a segment by segment comparison between the 1990 RCR and this current updated TCR.

Historically, the original Route Concept Reports were developed in 1984 and the future concept was based on the SANDAG Series 6 Population and Travel Forecasts for the year 2005. The 1990 Route Concepts were based on the SANDAG Series 7 Population and Travel Forecasts for the year 2010. The 1996 Transportation Concepts are based on the SANDAG Series 8 Population and Travel Forecasts for the year 2015.

TABLE 19
COMPARISON OF CONCEPTS

1990 Route Concept for 2010 (Series 7 2010 Forecast)		1995 Transportation Concept for 2015 (Series 8 2015 Forecast)	
Location	**No. Lanes/ Facility Type/ Concept LOS**	**Location**	**No. Lanes/ Facility Type/ Concept LOS**
Sunset Cliffs to Midway Drive	4F/E	Sunset Cliffs to Midway Drive	4F/E
Midway Drive to I-5	4F/E	Midway Drive to I-5	4F/ E
I-5 to SR-163	10F/E	I-5 to SR-163	10F/ F_0
SR-163 to I-805	8F/E	SR-163 to I-805	8F/ F_0
I-805 to I-15	8F/F_0	I-805 to I-15	8F/F_0
I-15 to Lake Murray Blvd.	8F/F_0	I-15 to Lake Murray Blvd.	10F/F_0
Lake Murray Blvd. to SR-125	8F/ F_0	Lake Murray Blvd. to SR-125	8F/ E
SR-125 to SR-67	8F/E	SR-125 to SR-67	8F/ E
SR-67 to Greenfield Drive	8F/E	SR-67 to Greenfield Drive	8F/E
Greenfield Drive to 0.5 mile east of Dunbar Lane	6F/D	Greenfield Drive to Dunbar/Harbison Cyn.	6F/E
		Dunbar/Harbison Cyn. to Tavern	6F/E
0.5 mile east of Dunbar Lane to Urban/Rural limit	6F/D	Tavern to Urban/Rural limit	6F/E
Urban/Rural limit to SR-79	4F/B	Urban/Rural limit to SR-79	4F/B
SR-79 to Imperial County Line	4F/B	SR-79 to Imperial County Line	4F/B
Imperial County Line to 1.5 miles east of Forrester Road	4F/B	Imperial County Line to Imperial Ave.	4F/B
1.5 miles east of Forrester Road to SR-111	4F/D	Imperial Ave. to SR-111	4F/D
SR-111 to Arizona State Line	4F/B	SR-111 to Arizona State Line	4F/B

Table 20 identifies only the I-8 segments where, with the Concept Facility in place, the 2015 Operating LOS remains at a deficient level. This table illustrates the LOS that could be achieved by enlarging the facility beyond the Concept Facility size. For these segments the table lists increasingly larger facility sizes, starting with the number of lanes called for in the Transportation Concept and ending with the number of lanes required to achieve the CMP standard. The Concept Facility information is shown on the line adjacent to the segment number. The larger alternative facility information is shown in italics.

The table shows that large facilities, as wide as 12 lanes in some segments, would be necessary to reach a nondeficient LOS “D.” Due to high costs and associated impracticalities, these facility sizes are not proposed as the Transportation Concept for these segments.

TABLE 20
MAIN LANES REQUIRED TO ACHIEVE IMPROVED LEVEL OF SERVICE

Segment	Location	Concept Facility/ *Alternative Facilities*	D/C	Peak Hour Operating LOS
2	Midway Drive to I-5	4F *6F*	1.25 *0.66*	F_0 *C*
4	SR-163 to I-805	8F *10F*	1.34 *0.93*	F_1 *E*
5	I-805 to I-15	8F *10F*	1.38 *0.96*	F_2 *E*
6	I-15 to Lake Murray Blvd.	10F *12F*	1.27 *0.74*	F_1 *C*
7	Lake Murray Blvd. to SR-125	8F *10F*	1.21 *0.81*	F_0 *D*
8	SR-125 to SR-67	8F *10F*	1.13 *0.77*	F_0 *C*

D/C = Demand to Capacity

2015 TRANSPORTATION CONCEPT FACILITY IMPROVEMENTS

The 2015 Transportation Concept map (Figure 3) on the next page graphically depicts the location of facility improvements included in the 2015 Transportation Concept for I-8. The D/C ratio and Peak Hour Operating LOS figures listed assume completion of the proposed improvements. The 2015 Transportation Concept for Segments 1, 2, 4-8 and 13-20 reflect no changes to the existing facility. However, Segments 3 and 9-12 have been identified for future highway improvements.

The main lane facility improvements to I-8, along with planned operational and safety improvements, will facilitate interregional travel throughout and between San Diego County and Imperial County, improve intercity and international travel between Mexico and San Diego, and provide an improved facility for the movement of goods throughout the region.

Additional strategies, including TDM and TSM, such as Park and Ride facilities, should be implemented where appropriate.

POST-2015 ULTIMATE TRANSPORTATION CORRIDOR

The UTC describes the long term (beyond the 20 year planning period) right of way requirements for a particular segment. The long term needs are determined by Advanced Transportation System Development (ATSD) activities which include investigation and analysis of community plans, general plans, transportation plans, land use plans, environmental documents, and other planning documents. The intent is to take advantage of or develop opportunities for long term right of way acquisition and to work with local and regional agencies to implement corridor preservation measures. The UTC proposes the number of

lanes, the facility type, and the minimum right of way width in meters (feet) for the conventional highway portions of the route. This width can be variable depending upon the dimensions of cross-sectional elements and specific circumstances which may require narrow widths. Minimum right of way width includes the roadbed, shoulder, clear recovery area, and minimum catch point distance to the cut or fill slope. Additional right of way may be required for structures, slope modifications and drainage facilities.

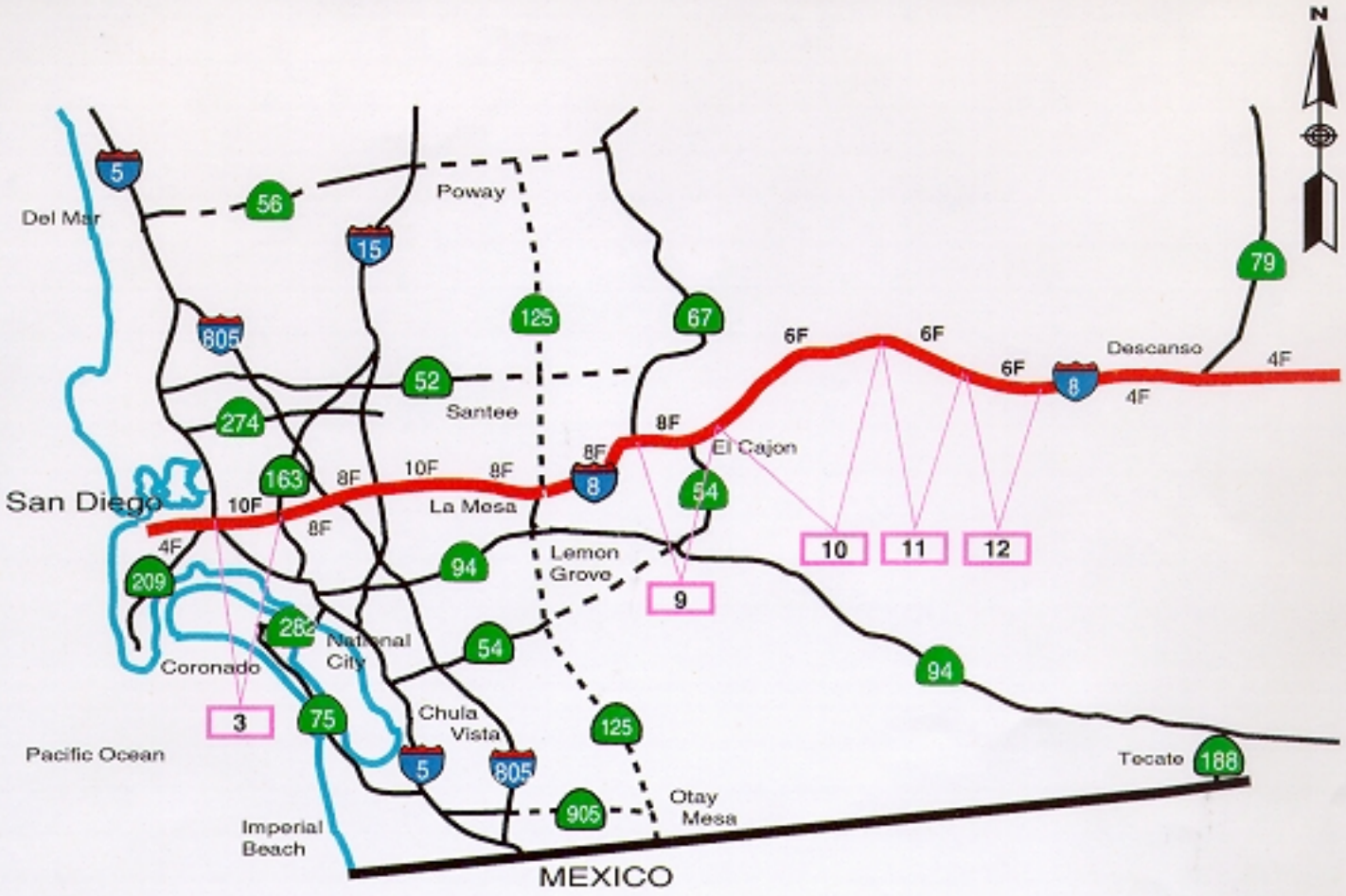
For I-8, the UTC is the same as the 2015 Transportation Concept for all segments except 10, which calls for the addition of two main lanes. The UTC number of lanes and facility type is based on Caltrans and SANDAG planning studies, the 1990 ICTP, the 1993 Imperial County General Plan, and the 1994 SCAG Draft Regional Mobility Element (RME). The minimum right of way width is based on standards promulgated by Caltrans Design Manual Section 306.1. Table 19 shows the number of lanes and the facility type for the UTC for I-8.

TABLE 21
POST-2015 ULTIMATE TRANSPORTATION CORRIDOR

	Segment/ County Post-Mile	Location	No. Lanes/ Facility Type
1	SD L0.0 - L1.2	Sunset Cliffs Blvd. to Midway Drive	4F
2	SD L1.2 - R0.0	Midway Drive to I-5	4F
3	SD R0.0 - 2.4	I-5 to SR-163	10F
4	SD 2.4 - 4.4	SR-163 to I-805	8F
5	SD 4.4 - 5.6	I-805 to I-15	8F
6	SD 5.6 - 9.6	I-15 to Lake Murray Blvd.	10F
7	SD 9.6 - 12.4	Lake Murray Blvd. to SR-125	8F
8	SD 12.4 - 15.8	SR-125 to SR-67	8F
9	SD 15.8 - R18.7	SR-67 to Greenfield Drive	8F
10	SD R18.7 - R25.7	Greenfield Drive to Dunbar/Harbison Cyn.	8F
11	SD R25.7 - R28.5	Dunbar/Harbison Cyn. to Tavern Road	6F
12	SD R28.5 - R31.3	Tavern to W. Willows (Urban/Rural limit)	6F
13	SD R31.3 - R34.3	W. Willows (U/R limit) to E. Willows	4F
14	SD R34.3 - R37.8	E. Willows to Japatul (SR-79)	4F
15	SD R37.8 - R65.9	Japatul (SR-79) to Ribbonwood (SR-94)	4F
16	SD R65.9 - R77.8	Ribbonwood (SR-94) to Imperial Co. Line	4F
17	IMP R0.0 - R37.0	San Diego County Line to Imperial Ave.	4F
18	IMP R37.0 - R40.9	Imperial Ave. to SR-111	4F
19	IMP R40.9 - R65.8	SR-111 to SR-98	4F
20	IMP R65.8 - R97.0	SR-98 to Arizona State Line	4F

For segment 10 (Greenfield Drive to Dunbar/Harbison Canyon Road), the UTC calls for upgrading the existing four-lane facility to an eight-lane freeway. The ultimate facility will accommodate growth which is expected to occur near and beyond the twenty year planning horizon. In addition, by upgrading Segment 10, I-8 will become a continuous facility of eight or more lanes from I-5 in San Diego to Dunbar/Harbison Canyon Road.

Figure 3
2015 Transportation Concept Improvements



LEGEND

——— Freeways

- - - - - - Future Freeways

CALIFORNIA DEPARTMENT OF TRANSPORTATION
DISTRICT 11
SYSTEM PLANNING BRANCH
NOVEMBER 1996
NOT TO SCALE

2015 TRANSPORTATION CONCEPT FACILITY IMPROVEMENTS

	Segment/ County Post Mile	Location	Improvement Description	Peak Hour V/C Ratio	Peak Hour Operating LOS	Concept LOS
3	SD R0.0 - 2.4	I-5 to SR-163	Upgrade from 8F to 10F	0.97	E	E
9	SD 15.8 - R18.7	SR-67 to Greenfield Drive	Upgrade from 6F to 8F	0.90	D	D
10	SD R18.7 - R25.7	Greenfield Drive to Dunbar/ Harbison Canyon	Upgrade from 4F to 6F	0.69	C	D
11	SD R25.7 - R28.5	Dunbar/Harbison Canyon to Tavern	Upgrade from 4F to 6F	0.66	C	D
12	SD R28.5 - R31.3	Tavern to W. Willows (U/R Limit)	Upgrade from 4F to 6F	0.33	A	B

No improvements are proposed for segments in Imperial County.

Segment 6 has non-standard width of the traveled way. Improvement to meet federal interstate standards would not result in added lanes or increased capacity.

6F = Six lane freeway
8F = Eight lane freeway
10F = Ten lane freeway
LOS = Level of Service (For Concept Facility)
V/C = Volume to Capacity (For Concept Facility)
Concept LOS is based on SANDAG CMP standards and District System Planning LOS guidelines for San Diego and Imperial Counties

APPENDIX A
LIST OF SYSTEM PLANNING ACRONYMS

ADT	Average Weekday Traffic
APCD	Air Pollution Control District
ATSD	Advanced Transportation System Development
AVI	Automated Vehicle Identification
CCAA	California Clean Air Act
CMP	Congestion Management Plan
D/C	Demand to Capacity Ratio
DSMP	District System Management Plan
ETTM	Electronic Toll Collection and Traffic Management
HOV	High Occupancy Vehicle
ICT	Imperial County Transit
ICTP	Imperial County Transportation Plan
IRRS	Interregional Road System
ISTEA	Intermodal Surface Transportation Efficiency Act
ITS	Intelligent Transportation Systems
IVAG	Imperial County Association of Governments
LOS	Level of Service
LROP	Long Range Operations Plan
LRT	Light Rail Transit
MIS	Major Investment Study
MSL	Maintenance Service Level
MTDB	Metropolitan Transit Development Board
NAFTA	North American Free Trade Agreement
NHS	National Highway System
PHV	Peak Hour Volume
P.M.	Post Mile
POE	Port of Entry
PR	Project Report
PSR	Project Study Report
R/W	Right of Way
RAQS	Regional Air Quality Strategy
RAS	Regional Arterial System
RCR	Route Concept Report
RME	Regional Mobility Element
RTIP	Regional Transportation Improvement Program
RTP	Regional Transportation Plan
SANDAG	San Diego Association of Governments
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SD&AE	San Diego and Arizona Eastern Railway
SD&IV	San Diego and Imperial Valley Railroad
SEDAB	Southeast Desert Air Basin
SOV	Single Occupancy Vehicle
SPA	Specific Plan Area
STAA	Surface Transportation Assistance Act
STIP	State Transportation Improvement Program
TASAS	Traffic Accident Surveillance and Analysis System
TCM	Transportation Control Measures
TCR	Transportation Concept Report
TDM	Transportation Demand Management

TMA	Transportation Management Association
TMC	Transportation Management Center
TSDP	Transportation System Development Plan
TSM	Transportation Systems Management
UP/SP	Union Pacific/Southern Pacific Railroad
UTC	Ultimate Transportation Corridor
V/C	Volume to Capacity Ratio
VMT	Vehicle kilometers (Miles) of Travel

APPENDIX B
LEVEL OF SERVICE (LOS) DEFINITIONS

LOS is defined as a qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers. An LOS definition generally describes these conditions in terms of such factors as speed, travel time, freedom to maneuver, comfort and convenience, and safety. LOS definitions can generally be categorized as follows:

LOS	D/C	Congestion/Delay	Traffic Description
		(Used for all conventional highways)	
"B"	<0.45	None	Free to stable flow, light to moderate volumes.
"C"	0.46 - 0.65	None to Minimal	Stable flow, moderate volumes, freedom to maneuver noticeably restricted.
"D"	0.66 - 0.85	Minimal to Substantial	Approaches unstable flow, heavy volumes, very limited freedom to maneuver.
"E"	0.86 - 1.00	Significant	Extremely unstable flow, maneuverability and psychological comfort extremely poor.
"F"	>1.00	Considerable Delay	Forced or breakdown flow. measured in average travel speed (MPH). Signalized segments experience delays >60.0 seconds per vehicle.
		(Used for two and four lane freeways and expressways)	
"A"	<.34	None	Free flow.
"B"	0.35-0.52	None	Free to stable flow, light to moderate volumes.
"C"	0.53-0.69	None to minimal	Stable flow, moderate volumes, freedom to maneuver noticeably restricted.
LOS	**D/C**	**Congestion/Delay**	**Traffic Description**
"D"	0.70-0.92	Minimal to substantial	Approaches unstable flow, heavy volumes, very limited freedom to

			maneuver.
"E"	0.93-1.00	Significant	Extremely unstable flow, maneuverability and psychological comfort extremely poor.

(Used for six lane freeways and expressways)

"A"	< .39	None	Free flow
"B"	0.40-0.59	None	Free to stable flow, light to moderate volumes
"C"	0.60-0.74	None to Minimal	Stable flow, moderate volumes freedom to maneuver noticeably restricted
"D"	0.75-0.92	Minimal to Substantial	Approaches unstable flow, heavy volumes, very limited freedom to maneuver
"E"	0.93-1.00	Significant	Extremely unstable flow, maneuverability and psychological comfort extremely poor

(Used for freeways with eight or more lanes)

"A"	< .42	None	Free flow
"B"	0.43-0.62	None	Free to stable flow, light to moderate volumes
"C"	0.63-0.79	None to Minimal	Stable flow, moderate volumes, freedom to maneuver noticeably restricted
"D"	0.80-0.92	Minimal to Substantial	Approaches unstable flow, heavy volumes, very limited freedom to maneuver
"E"	0.93-1.00	Significant	Extremely unstable flow, maneuverability and psychological comfort extremely poor

LOS	D/C	Congestion/Delay	Traffic Description
		(Used for freeways and expressways)	
"F0"	1.01-1.25	Considerable 0-1 hour delay	Forced flow, heavy congestion, long queues form behind breakdown points, stop and go.
"F1"	1.26-1.35	Severe 1-2 hour delay	Very heavy congestion very long queues.
"F2"	1.36-1.45	Very severe 2-3 hour delay	Extremely heavy congestion, longer queues, more numerous breakdown points, longer stop periods.
"F3"	>1.46	Extremely severe 3+ hours of delay	Gridlock

I approve this Transportation Concept Report as the guide for development of Interstate 8 over the next 20 years.

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